STATE WATER RESOURCES CONTROL BOARD UNDERGROUND STORAGE TANK REGULATIONS AMENDMENTS FOR IMPLEMENTATION OF SB 989

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STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
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FINAL RULEMAKING FILE

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DECLARATION

The foregoing index represents the rulemaking file of the subject proposed regulations of the State Water Resources Control Board (SWRCB), Division of Clean Water Programs, Underground Storage Tank Program. The rulemaking file as submitted is complete. The rulemaking records for these regulations closed at 5:00 p.m. on March 15, 2001.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge.

Executed at Sacramento, California on April 2, 2001.

Chas NeSmith

Charles NeSmith, Associate Engineering Geologist
Division of Clean Water Programs
State Water Resources Control Board

i. SWRCB Hearings and Adoption of Package

RECEIVED
MAY 16 2001
SWRCB
EXECUTIVE OFFICE

STATE OF CALIFORNIA
OFFICE OF ADMINISTRATIVE LAW

In re:

STATE WATER RESOURCES CONTROL BOARD

REGULATORY ACTION:

Title 23, California Code of Regulations

Adopt sections 2636.1, 2636.2, 2636.3, 2636.4, 2637, 2644.1

Amend sections 2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, 2666

NOTICE OF APPROVAL OF REGULATORY ACTION

ORIG: CWP
cc: OCC

Government Code Section 11349.3

OAL File No. 01-0402-01 S

This action updates the underground storage tank regulations to implement statutory changes that require periodic testing of secondary containment systems, standards for under-dispenser containment and enhanced leak detection, and an appeal procedure.

OAL approves this regulatory action as meeting all applicable legal requirements.

DATE: 05/14/01

David D. Potter

DAVID D. POTTER
Senior Staff Counsel

for: DAVID B. JUDSON
Deputy Director/Chief Counsel

Original : Edward C. Anton, Executive Director
cc : Charles NeSmith

RECEIVED
MAY 17 2001
Division of Clean Water Programs

RECEIVED
MAY 15 2001
Division of Clean Water Programs

STATE OF CALIFORNIA
OFFICE OF ADMINISTRATIVE LAW

In re: **STATE WATER RESOURCES CONTROL BOARD** **REGULATORY ACTION:** **Title 23, California Code of Regulations** **Adopt sections** **2636.1, 2636.2, 2636.3, 2636.4, 2637, 2644.1** **Amend sections** **2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, 2666**	**NOTICE OF APPROVAL OF REGULATORY ACTION** **Government Code Section 11349.3** **OAL File No. 01-0402-01 S**

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DATE: 05/14/01

David D. Potter
DAVID D. POTTER
Senior Staff Counsel

for: DAVID B. JUDSON
Deputy Director/Chief Counsel

Original : Edward C. Anton, Executive Director
cc : Charles NeSmith

STATE OF CALIFORNIA

OFFICE OF ADMINISTRATIVE LAW

MEMORANDUM

To: Charles NeSmith

Date: 06/28/01

File# 01-0402-01 S

Phone: 916-323-6225

From: OAL Front Counter

Subject: RETURN OF APPROVED RULEMAKING MATERIALS

OAL hereby returns this Approved file your agency submitted for our review.

If this is an approved file, it contains a copy of the regulation(s) stamped "ENDORSED FILED" by the Secretary of State. The effective date of an approved file is specified on the date Form 400 (see item B.4) Note : The 30th Day after filing with the Secretary of State is calculated from the date Form 400 was stamped "ENDORSED FILED" by the Secretary of State.

DO NOT DISCARD OR DESTROY THIS FILE

Due to its legal significance, please retain this rulemaking record. Government Code section 11347.3(d) requires that this record be available to the public and to the courts for possible later review. Government Code section 11347.3(e) further provides that " ...no item contained in the file shall be removed, altered, or destroyed or otherwise disposed of ." See also the Records Management Act (Government Code section 14740 et seq.) and the State Administrative Manual (SAM) section 1600 et seq.) regarding retention of your records. If you decide not to keep this rulemaking at your agency office or at the State Records Centre, you may transmit it to the State Archives with instructions that the Secretary of State shall not remove, alter, or destroy or otherwise dispose of any item contained in the file. See Government Code section 11347.3(f)

enclosures

Winston H. Hickox
Secretary for
Environmental
Protection

State Water Resources Control Board

Executive Office
1001 I Street • Sacramento, California 95814 •(916) 341-5600
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
FAX (916) 341-5620 • Web Site Address: http://www.swrcb.ca.gov

Gray Davis
Governor

CERTIFICATION

1. I, Maureen Marché, am the Clerk to the State Water Resources Control Board. I am custodian of certain records maintained by the State Water Board.

2. I hereby certify that the attached is a full, true, and correct copy of:

   February 15, 2001 agenda item, proposed resolution, and February 6, 2001 draft regulations regarding underground storage tank regulations, Title 23, Division 3, Chaper 16, CCR, amendments for implementation of SB 989.

   Copy of Resolution No. 2001-024, Approval of Proposed Revised Regulations Governing Underground Storage Tanks

   Copy of the minutes of the February 15, 2001 meeting showing no changes were made to the proposed regulations.

Executed on May 14, 2001 in Sacramento, California.

Maureen Marché
Maureen Marché
Clerk to the Board

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2001 - 024

APPROVAL OF PROPOSED REVISED REGULATIONS GOVERNING UNDERGROUND STORAGE TANKS

WHEREAS:

1. The Legislature enacted Health and Safety Code Chapter 6.7 to establish orderly procedures that will ensure that underground storage tanks meet appropriate standards and are installed, maintained, inspected, tested, and upgraded so that the health, property, and resources of the people of the state will be protected.

2. The SWRCB administers the Underground Storage Tank (UST) Program, and local agencies implement the program through UST permitting and enforcement.

3. Health and Safety Code section 25299.33 of chapter 6.7 authorizes the SWRCB to adopt regulations to implement chapter 6.7.

4. In October 1999, the Legislature amended chapter 6.7 by enacting Senate Bill 989 (stats.1999, ch 812).

5. On May 12, 2000 the SWRCB published a notice of proposed rulemaking to implement, interpret, and clarify the recent amendments to chapter 6.7, and on July 18, 2000 held a public hearing regarding the proposed regulations.

6. The SWRCB received several written and/or oral comments and, based on the accepted comments and on SWRCB initiated changes, the proposed regulations were revised and re-noticed to commenters for further comments for 15 days. Additional comments were received during the 15-day notice, and the SWRCB revised the regulations in response to these comments and re-noticed the changes. This process was repeated for a third and final 15-day notice. Although additional comments were received during the last 15-day comment period, the SWRCB rejected all of these comments and no further revisions were made to the proposed regulations. prior to the January 31, 2001 SWRCB board workshop.

   However, at the SWRCB board workshop on January 31, 2001 the board directed SWRCB staff to make non-substantial changes to subdivision 2637(a)(2), in response to oral comments presented at the workshop. Staff have made these changes as directed.

7. The SWRCB has determined that it is appropriate and desirable to amend the Underground Storage Tank regulations identified in the notice of proposed rulemaking, the 15-day notice of change of text, and the final statement of reasons, and that no revisions to the amendments are necessary in light of the final public comments received.

THEREFORE BE IT RESOLVED THAT:

The State Water Resources Control Board adopts the proposed amendments to the Underground Storage Tank regulations to implement, interpret, and make specific chapter 6.7 of the Health and Safety Code, which will become effective as provided by the California Administrative Procedure Act upon approval by the Office of Administrative Law and filing with the Secretary of State, and directs the Executive Director to submit the proposed amendments to the Office of Administrative Law for approval.

CERTIFICATION

The undersigned, Adminstrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 15, 2001.

Maureen Marché

Maureen Marché
Administrative Assistant to the Board

STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING MINUTES
February 15, 2001

Note: Copies of the orders, decisions, and resolutions mentioned in these minutes can be obtained from Maureen Marché, State Water Resources Control Board, Post Office Box 100, Sacramento, California, 95812-0100; or call (916) 341-5600.

CALL TO ORDER
The meeting was called to order by Arthur G. Baggett, Jr., Acting Chair, February 15, 2001, at 9:00 a.m., in the First-Floor Hearing Room, 901 "P" Street, Sacramento, California

BOARD MEMBERS PRESENT
Arthur G. Baggett, Jr., Mary Jane Forster, John W. Brown and Peter S. Silva.

BOARD MEMBERS ABSENT
None

STAFF PRESENT
Ed Anton, Thomas Howard, Craig M. Wilson, Maureen Marché, Barbara Leidigh, Barbara Katz, Michael Gjerda, Charles Nesmith, and Jim Sutton.

OTHERS PRESENT
Phillip Edwards, Syntectics; Jim Colbaugh, Las Virgenes Municipal Water District; Jorge Leon, Los Angeles Regional Water Resources Control Board; Ron Wilkniss, WSPA; Maryann Gonzalez, WSPA; Kim Wiseman, WSPA; Ed Dinkfield, WSPA; Curtis Weeks and Kevin O'Brien, Monterey County Water Resources Agency; Tom Vrsik, Salinas Valley Protesters; Martha Lennihan, East Side Water Alliance; Jan Goldsmith, Salinas Valley Water Coalition; Robert Donlan, Tomimura and Antle; Ryan Bezerra, Rosenberg Family Ranch, Clark Colony Water Company; Richard Moss, P G & E; Ben Hulse, San Joaquin County; Michael B. Jackson, Fred Etheridge, East Bay Municipal Utilities District; Richard A. Denton, Contra Costa Water District; Nancee Murray, Department of Fish and Game; Cathy Crothers, Department of Water Resources; Barbara Brenner & Anne Schneider, Delta Wetlands; Dante John Nomellini, Central Delta Water Agency;

PUBLIC FORUM
No one addressed the Board.

UNCONTESTED ITEMS
Items 1 and 8 were removed from the uncontested items calendar. Items 2 – 7 and 9 - 10 were unanimously approved by the Board as recommended by staff.

CLEAN WATER PROGRAMS
1. Consideration of Approval of Adoption of Emergency Regulations for Electronic Submission of Laboratory Analytical Data for Underground Storage Tank (UST) Reports.

Michael Gjerde, Division of Clean Water Programs, presented the item and summarized recent changes to the regulations.

Philip Edwards addressed the Board.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 023**

2. Consideration of Approval of a Proposed Resolution Amending the Underground Storage Tank (UST) Cleanup Fund Priority List – Amendment No. 82.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 016**

3. *Consideration of Approval to Increase the Small Community Grant (SCG) Eligibility Percentage for the City of Plymouth.*

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 017**

4. Consideration of Approval to Reauthorize State Revolving Fund (SRF) Loan Commitments for the Los Angeles County Sanitation District's (LACSD) Joint Water Pollution Control Plant (JWPCP) Upgrade and Santa Ana Watershed Project Authority's (SAWPA) Temescal Valley Regional Interceptor (TVRI) Project.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 018**

5. Consideration of Approval of a Time Extension for the City of Beaumont for a Grant from the Water Recycling Facilities Planning Grant Program.

Motion: *The Board unanimously adopted the proposed resolution.* **Resolution 2000 - 019**

6. Consideration of Approval of a State Revolving Fund (SRF) Loan for the City of Rosamond Wastewater Treatment Plant Expansion Project No. C-06-4148-110

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2000 - 020**

WATER QUALITY PETITIONS

7. In the Matter of the Petition of the County of San Diego, San Marcos Landfill for Review of Assessment of Administrative Civil Liability Order No. 2000-82, Issued by the California Regional Water Quality Control Board, San Diego Region. SWRCB File A-1302.

Motion: The Board unanimously adopted the proposed order granting the petition in part *and remanding the matter to the San Diego Regional Board.* **Water Quality Order 2001 - 01**

8. In the Matter of the Petition of Las Virgenes *Municipal Water District for Review of* Waste Discharge Requirements Order No. 99-142, Issued by the California Regional Water Quality Control Board, Los Angeles Region. SWRCB File A-1263.

No staff presentation was made. Jim Colbaugh addressed the Board regarding *a prohibition period.*

Jorge Leon addressed the Board stating the Regional Board was in opposition to the suggestion.

The Board directed the following additional paragraph be added to the proposed order at the top of page 8, before III. CONCLUSIONS: "Following the Board workshop on this item, the District proposed a modification to the seven-month fixed discharge prohibition. The District proposed a six-month prohibition from May 1 to October 30, with a flexible prohibition period from April 15 to April 30 and November 1 to November 15 of each year. During the flexible prohibition period the District would be permitted to discharge if background flows in the creek exceed 10 cfs and the lagoon is open. Although there is not sufficient time to evaluate the District's proposal in these proceedings, the Regional Board should *consider the District's proposal* the next time it reissues the district's permit.

Motion: The Board unanimously adopted the proposed order.
Water Quality Order 2001 - 03

WATER RIGHTS

9. Consideration of a Resolution Authorizing the Executive Director to Enter into an Agreement with the Monterey County Water Resources Agency to Provide Funding for Conducting

Investigations to Support a Physical Solution or, if Necessary, State Adjudication to Address the *Seawater Intrusion Problem.*

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 021**

WATER QUALITY

10. Consideration of a Resolution Delegating to the Executive Director Authority to Negotiate, Execute, and Amend Contracts Supporting Total Maximum Daily Load Work.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 022**

CLEAN WATER PROGRAMS

11. Consideration of a Resolution Adopting Proposed Regulations to Implement Amendments to Chapter 6.7 of the Health and Safety Code Enacted Through Senate Bill 989.

Charles Nesmith, Division of Clean Water Programs, presented the item, recommending adoption of the proposed regulations.

Ron Wilkniss, Maryann Gonzalez, Kim Wiseman, and Ed Dinkfeld addressed the Board.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 024**

WATER QUALITY PETITIONS

12. In the Matter of the Petition of the City of Los Angles for Review of Assessment of Administrative Civil Liability Order No. 99-102, Issued by the California Regional Water Quality Control Board, Los Angeles Region. SWRCB File A-1295.

No staff presentation was made and no one addressed the Board.

Motion: The Board unanimously adopted the proposed order.
Water Quality Order 2001 - 02

WATER RIGHTS

13. Consideration of a Proposed Decision Regarding Application 30532 of Monterey County Water Resources Agency to Divert 27,900 Acre Feet to Storage in Nacimiento Reservoir in San Luis Obispo County.

Barbara Katz, Office of Chief Counsel, presented the item noting written comments received on this issue. Ms. Katz also noted a revision to page 21, deleting the reference to permit term 90.

Curtis Weeks, Kevin O'Brien and Tom Virsik addressed the Board.

Motion: The Board unanimously adopted the proposed decision. **Decision 1642**

14. Consideration of a Proposed Resolution Certifying the Environmental Impact Report for the Delta Wetlands Project.

Jim Sutton, Division of Water Rights, presented the item, recommending adoption of the proposed resolution.

Dante John Nomellini, Ben Hulse and Michael Jackson addressed the Board.

Motion: The Board unanimously adopted the proposed resolution. **Resolution 2001 - 025**

15. Consideration of a Proposed Decision Approving Water Right Applications and Petitions of the Delta Wetlands Project in the San Francisco Bay/Sacramento San Joaquin Delta Estuary in Contra Costa and San Joaquin Counties.

Barbara Leidigh, Office of Chief Counsel, addressed the Board and noted a revised February 15 version of the proposed decision in response to the comments received. In addition to those revisions, Ms. Leidigh noted two additional changes: page 34, first bullet, "couse" should be replaced with "cause". Page 35, the table, the number "0.0084" should be "0.008". page 81, second paragraph, next-to-last line strike the words "and still be".

Michael Jackson, Fred Etheridge, Richard Denton, Nancee Murray, Cathy Chers, Anne Schneider, Dante John Nomellini and Richard Moss addressed the Board.

Following the discussion, the Board directed additional revisions to the draft decision. Page 82, remove term 91; page 82, Term 5, a. Points of Diversion, (1) Applications 29062 and 30268 (Webb Tract), add two additional points of diversion; and page 96, Term 22 b, last sentence: Commencing on the date when ~~the water right applications are approved~~ all required approvals for levee construction have been secured, any levee maintenance and/or improvement activities shall be considered to be levee construction or strengthening for the purpose of this condition."

Motion: The Board unanimously adopted the proposed decision as revised during the meeting. **Decision 1643**

BOARD MEMBER REPORTS
The Board Members reported on various meetings they have attended on behalf of the Board.

EXECUTIVE DIRECTOR'S REPORT
The Executive Director submitted a written report summarizing current significant issues.

ADJOURNMENT
The Acting Chair adjourned the meeting at 12:00 p.m.

STATE WATER RESOURCES CONTROL BOARD
SACRAMENTO, CALIFORNIA
February 15, 2001

ITEM 11

SUBJECT

PROPOSED RESOLUTION ADOPTING AMENDMENTS TO THE UNDERGROUND STORAGE TANK REGULATIONS

DISCUSSION

Management of Underground Storage Tanks (UST's) in California is regulated under both federal and State law. Applicable federal law is found in the Resource Conservation and Recovery Act (RCRA) Subtitle I, Section 9003 and regulations implementing federal laws are found in 40 CFR, part 280. Section 9004 of RCRA permits the U.S.EPA (EPA) to authorize states to implement their own UST programs in place of the federal requirements if the state's requirements are "no less stringent" than EPA's, and provide for adequate enforcement. Applicable state law is incorporated into Health and Safety Code (HSC) Chapter 6.7, commencing with section 25280, and related regulations in Title 23, Division 3, Chapter 16, California Code of Regulations (CCR).

The California Legislature enacted HSC Chapter 6.7 in 1984 and has since amended Chapter 6.7 in response to either federal mandates relating to underground storage tanks (UST), or new information regarding changing industry practices and/or the performance of UST's meeting then current UST regulatory standards in California. In October 1999, the Legislature amended Chapter 6.7 by enacting Senate Bill 989, which essentially codifies executive order D-5-99. This executive order was the Governor's response to a University of California report on the environmental impacts of Methyl Tertiary Butyl Ether (MTBE) -- an additive put into motor vehicle fuel beginning in the late 1980's, early 90's. The executive order requires the phase-out of MTBE in fuel by December 31, 2002.

Since current underground storage tank laws and regulations were promulgated absent this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with more stringent construction and monitoring standards for underground storage tanks. These new construction and monitoring requirements were based primarily on recommendations of two SWRCB panels, the Advisory Panel on the Leak History of New and Upgraded UST Systems (Leak History Panel) and the California Leak Monitoring group (CALM). The proposed regulations, where necessary, implement, interpret, and make specific, newly enacted legislation regarding UST installers, secondary containment testing, under-dispenser containment, annual maintenance certification, and leak detection for single-walled UST's (Health and Safety Code sections 25284.1 and 25292.4, enacted through Senate Bill 989 (stats.1999, ch 812).

A Notice of Proposed Rulemaking announcing the proposed amendments to the regulations was published in the May 12, 2000 issue of the California Regulatory Notice Register. A public hearing regarding the proposed regulations was held on July 18, 2000 in Alhambra. The SWRCB received several written and/or oral comments and, based on those comments, the proposed regulations were revised. Pursuant to Government Code section 11346.8(c), and section 44 of Title 1 of the California Code of Regulations, the revised proposed regulations were mailed to all commenters to comment on the revisions within 15 days of the mailing. Additionally, all attendees of the public hearing, and interested parties requesting the mailing were sent the revised proposed regulations for comment.

Additional comments were received during the 15-day notice, and the SWRCB revised the regulations in response to these comments and re-noticed the changes. This process was repeated for a third and final 15-day notice. Although more comments were received during the last 15-day comment period, the SWRCB rejected all of these comments and no further revisions were made to the proposed regulations prior to the January 31, 2001 SWRCB board workshop.

However, at the SWRCB board workshop on January 31, 2001 the board directed SWRCB staff to make non-substantial changes to subdivision 2637(a)(2), in response to oral comments presented at the workshop. Staff have made these changes as directed.

POLICY ISSUE

Should the SWRCB adopt the amendments to the Underground Storage Tank regulations as proposed?

FISCAL ISSUE

State agencies that own or operate underground storage tanks (UST's) may incur additional costs as a result of the proposed regulations depending on the type of system installed. The most significant additional cost will be for those systems that must install under-dispenser containment in accordance with the proposed regulations. The total first year estimated cost to the state as a result of the proposed regulations is $887,000 to $ 4.5 million dollars. Average ongoing state cost will be $187,600 annually.. The SWRCB expects that state agencies will not be able to absorb these additional costs within their existing budgets and resources.

RWQCB IMPACT

None.

STAFF RECOMMENDATION

That the SWRCB adopt a resolution that adopts the proposed amendments to the Underground Storage Tank Regulations to interpret, clarify, and implement legislative changes made to chapter 6.7 of the Health and Safety Code pursuant to chapter 812, statues of 1999 (Sher) (Senate Bill 989), and for the additional reasons established in the rulemaking file.

FEB 6 2001

(The Underground Storage Tank regulations are available electronically on the program website at http://www.swrcb.ca.gov/~cwphome/ust/usthmpg.htm.

Policy Review ____
Legal Review KAK
Fiscal Review ____

FEB 6 2001

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2001-

APPROVAL OF PROPOSED REVISED REGULATIONS GOVERNING UNDERGROUND STORAGE TANKS

WHEREAS:

1. The Legislature enacted Health and Safety Code Chapter 6.7 to establish orderly procedures that will ensure that underground storage tanks meet appropriate standards and are installed, maintained, inspected, tested, and upgraded so that the health, property, and resources of the people of the state will be protected.

2. The SWRCB administers the Underground Storage Tank (UST) Program, and local agencies implement the program through UST permitting and enforcement.

3. Health and Safety Code section 25299.33 of chapter 6.7 authorizes the SWRCB to adopt regulations to implement chapter 6.7.

4. In October 1999, the Legislature amended chapter 6.7 by enacting Senate Bill 989 (stats.1999, ch 812).

5. On May 12, 2000 the SWRCB published a notice of proposed rulemaking to implement, interpret, and clarify the recent amendments to chapter 6.7, and on July 18, 2000 held a public hearing regarding the proposed regulations.

6. The SWRCB received several written and/or oral comments and, based on the accepted comments and on SWRCB initiated changes, the proposed regulations were revised and re-noticed to commenters for further comments for 15 days. Additional comments were received during the 15-day notice, and the SWRCB revised the regulations in response to these comments and re-noticed the changes. This process was repeated for a third and final 15-day notice. Although additional comments were received during the last 15-day comment period, the SWRCB rejected all of these comments and no further revisions were made to the proposed regulations. prior to the January 31, 2001 SWRCB board workshop.

   However, at the SWRCB board workshop on January 31, 2001 the board directed SWRCB staff to make non-substantial changes to subdivision 2637(a)(2), in response to oral comments presented at the workshop. Staff have made these changes as directed.

6. The SWRCB has determined that it is appropriate and desirable to amend the Underground Storage Tank regulations identified in the notice of proposed rulemaking, the 15-day notice of change of text, and the final statement of reasons, and that no revisions to the amendments are necessary in light of the final public comments received.

THEREFORE BE IT RESOLVED THAT:

The State Water Resources Control Board adopts the proposed amendments to the Underground Storage Tank regulations to implement, interpret, and make specific chapter 6.7 of the Health and Safety Code, which will become effective as provided by the California Administrative Procedure Act upon approval by the Office of Administrative Law and filing with the Secretary of State, and directs the Executive Director to submit the proposed amendments to the Office of Administrative Law for approval.

CERTIFICATION

The undersigned, Adminstrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 15, 2001.

____

Marueen Marche'
Administrative Assistant to the Board

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

January 28, 2001

FINAL PROPOSED TEXT OF REGULATIONS

Amend Title 23, Division 3, Chapter 16, Article 1, section 2611 of the California Code of Regulations to read as follows:

2611. Additional Definitions

Unless the context requires otherwise, the following definitions shall apply to terms used in this chapter.

"Bladder system" means a flexible or rigid material which provides primary containment including an interstitial monitoring system designed to be installed inside an existing underground storage tank.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. The term includes only persons who have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"Coatings expert" means a person who, by reason of thorough training, knowledge, and experience in the coating of metal surfaces, is qualified to engage in the practice of internal tank lining inspections. The term includes only those persons who are independent of any lining manufacturer or applicator and have no financial interest in the tank or tanks being monitored.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which hazardous substances flow. For the purpose of determining how much piping is connected to any individual underground storage tank system, the piping that joins two underground storage tank systems should be allocated equally between them.

"Continuous monitoring" means a system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

"Dispenser" means an aboveground or underground device ~~connected to underground storage tank piping~~ that is used for the delivery of a hazardous substance from ~~the~~ an underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.

~~"Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.~~

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

"Heating oil tank" means a tank located on a farm or at a personal residence and which holds no more than 1,100 gallons of home heating oil which is used consumptively at the premises where the tank is located.

"Holiday," when used with respect to underground storage tank coating or cladding, means a pinhole or void in a protective coating or cladding.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Inconclusive" means the conclusion of a statistical inventory reconciliation report that is not decisive as to whether a release has been detected.

"Independent testing organization" means an organization which tests products or systems for compliance with voluntary consensus standards. To be acceptable as an independent testing organization, the organization shall not be owned or controlled by any client, industrial organization, or any other person or institution with a financial interest in the product or system being tested. For an organization to certify, list, or label products or systems in compliance with voluntary consensus standards, it shall maintain formal periodic inspections of production of products or systems to ensure that a listed, certified, or labeled product or system continues to meet the appropriate standards.

"Independent third party" means independent testing organizations, consulting firms, test laboratories, not-for-profit research organizations and educational institutions with no financial interest in the matters under consideration. The term includes only those organizations which are not owned or controlled by any client, industrial organization, or any other institution with a financial interest in the matter under consideration.

"Integral secondary containment" means a secondary containment system manufactured as part of the underground storage tank.

"Interstitial space" means the space between the primary and secondary containment systems.

"Leak threshold" means the value against which test measurements are compared and which serves as the basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate.

"Liquid asphalt tank" means an underground storage tank which contains steam-refined asphalts.

"Liquefied petroleum gas tank" means an underground storage tank which contains normal butane, isobutane, propane, or butylene (including isomers) or mixtures composed predominantly thereof in a liquid or gaseous state having a vapor pressure in excess of 40 pounds per square inch absolute at a temperature of 100 degrees Fahrenheit.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing hazardous substances.

"Manufacturer" means any business which produces any item discussed in these regulations.

"Manual inventory reconciliation" means a procedure for determining whether an underground tank system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. This term does not include procedures which are based on statistical inventory reconciliation.

"Membrane liner" means any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored.

"Membrane liner fabricator" means any company which converts a membrane liner into a system for secondary containment.

"Membrane manufacturer" means any company which processes the constituent polymers into membrane sheeting from which the membrane liner is fabricated into a system for secondary containment.

"Motor vehicle" means a self-propelled device by which any person or property may be propelled, moved, or drawn.

"Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil.

"New underground storage tank" means an underground storage tank which is not an existing underground storage tank.

"Non-volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and consideration of circumstances and physical phenomena internal or external to the tank.

"Operational life" means the period beginning when installation of the tank system has begun until the time the tank system should be properly closed.

"Operator" means any person in control of, or having responsibility for, the daily operation of an underground storage tank system.

"Person", as defined in Chapter 6.7 of Division 20 of the Health and Safety Code includes any entity defined as a person under the Federal Act.

"Perennial ground water" means ground water that is present throughout the year.

"Petroleum" means petroleum including crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.

"Pipeline leak detector" means a continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less.

"Probability of detection" means the likelihood, expressed as a percentage, that a test method will correctly identify a leaking underground storage tank.

"Probability of false alarm" means the likelihood, expressed as a percentage, that a test method will incorrectly identify a "tight" tank as a leaking underground storage tank.

"Qualitative release detection method" means a method which detects the presence of a hazardous substance or suitable tracer outside the underground storage tank being tested.

"Quantitative release detection method" means a method which determines the integrity of an underground storage tank by measuring a release rate or by determining if a release exceeds a specific rate.

"Release detection method or system" means a method or system used to determine whether a release of a hazardous substance has occurred from an underground tank system into the environment or into the interstitial space between an underground tank system and its secondary containment.

"Repair" means to restore a tank or underground storage tank system component that has caused a release of a hazardous substance from the underground storage tank system.

"Septic tank" means a tank designed and used to receive and process biological waste and sewage.

~~"Spill containment or control system" means a device that is capable of preventing an unauthorized release from the dispenser from entering the soil or groundwater or both.~~

"Statistical inventory reconciliation" means a procedure to determine whether a tank is leaking based on the statistical analysis of measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically.

"Statistical inventory reconciliation provider" means the developer of a statistical inventory reconciliation method that meets federal and state standards as evidenced by a third-party evaluation conducted according to section 2643(f), or an entity that has been trained and certified by the developer of the method to be used. In either case, the provider shall have no direct or indirect financial interest in the underground storage tank being monitored.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment

is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Substantially beneath the surface of the ground" means that at least 10 percent of the underground tank system volume, including the volume of any connected piping, is below the ground surface or enclosed below earthen materials.

"Sump," "pit," "pond," or "lagoon" means a depression in the ground which lacks independent structural integrity and depends on surrounding earthen material for structural support of fluid containment.

"Tank integrity test" means a test method that can ascertain the physical integrity of an underground storage tank. The term includes only test methods which are able to detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of 5 percent or less. The test method may be either volumetric or non-volumetric in nature. A leak rate is reported using a volumetric test method, whereas, a non-volumetric test method reports whether a substance or physical phenomenon is detected which may indicate the presence of a leak.

"Unauthorized release" as defined in Chapter 6.7 of Division 20 of the Health and Safety Code does not include intentional withdrawals of hazardous substances for the purpose of legitimate sale, use, or disposal.

"Under-Dispenser Containment" means secondary containment that is located under a dispenser.

"Under-Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of hazardous substances.

"Upgrade compliance certificate" includes a numbered decal, file copy of the decal, and plastic fill pipe tag as described in Section 2712.1 of these regulations.

"Volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and comparison of tank volume.

"Voluntary consensus standards" means standards that shall be developed after all persons with a direct and material interest have had a right to express a viewpoint and, if dissatisfied, to appeal at any point (a partial list of the organizations that adopt voluntary consensus standards are shown in Appendix I, Table B).

"Wastewater treatment tank" means a tank designed to treat influent wastewater through physical, chemical, or biological methods and which is located inside a public or private wastewater treatment facility. The term includes untreated wastewater holding tanks, oil water separators, clarifiers, sludge

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holding tanks, filtration tanks, and clarified water tanks that do not continuously contain hazardous substances.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25282, 25283, 25284, **25284.1**, 25292.3 and 25299.5(a), Health and Safety Code; 40 CFR 280.10 and 280.12.

Amend Title 23, Division 3, Chapter 16, Article 3, existing sections 2630, 2631, 2635, and 2636 of the California Code of Regulations to read as follows:

2630. General Applicability of Article

(a) The requirements in this article apply to owners of new underground storage tanks. ~~**Underground storage tanks installed after January 1, 1984, may be deemed to be in compliance with the requirements in this article if they were installed in accordance with federal and state requirements that existed at the time of installation.**~~ ~~However~~ **In addition**, the applicable repair and upgrade requirements in Article 6 shall be complied with.

(b) Sections 2631 and 2632 specify design, construction, and monitoring requirements for all new underground storage tanks. **Sections 2633 and 2634 specify alternate design, construction, and monitoring requirements, in lieu of those specified in sections 2631 and 2632, for underground storage tanks installed before January 1, 1997 which store only motor vehicle fuel.** ~~New~~ **Uu**nderground storage tanks ~~**which store only motor vehicle fuels may be**~~ **constructed** ~~**and monitored**~~ **pursuant to the requirements specified in sections 2633** ~~**and 2634**~~ **in lieu of those specified in sections 2631** ~~**and 2632. However, if the tank is constructed according to requirements in section 2633 the monitoring requirements of section 2634 shall also be met.**~~ **shall be monitored in accordance with section 2634.**

(c) All new underground storage tanks, piping, and secondary containment systems shall comply with sections 2635 and 2636.

(d) All monitoring equipment used to satisfy the requirements of **this article** ~~**sections 2632, 2634, and 2636**~~ *shall* meet the requirements of section 2643(f) and shall be installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity. Additionally, all monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated, and maintained in accordance with **section 2637(b).** ~~**manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.**~~

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1**, 25291 and 25292.3, Health and Safety Code; 40 CFR 280.20.

2631. Design and Construction Requirements for New Underground Storage Tanks

(a) All new underground storage tanks including associated piping used for the storage of hazardous substances shall have primary and secondary of containment. Primary containment shall be product-tight. Secondary containment may be manufactured as an integral part of the primary containment or it may be constructed as a separate containment system. **Secondary containment systems shall be designed and constructed such that the secondary containment system can be periodically tested in accordance with section 2637(a).**

(b) The design and construction of all primary containment including any integral secondary containment system, shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. All other components used to construct the primary containment system, such as special accessories, fittings, coatings or linings, monitoring systems and level controls used to form the underground storage tank system shall also be approved by an independent testing organization. This requirement became effective on July 1, 1991 for underground storage tanks; January 1, 1992 for piping; and shall be effective on January 1, 1995 for all other components. The exterior surface of underground storage tanks shall bear a marking, code stamp, or label showing the following minimum information:

(1) Engineering standard used;
(2) Nominal diameter in feet;
(3) Nominal capacity in gallons;
(4) Degree of secondary containment;
(5) Useable capacity in gallons;
(6) Design pressure in psig;
(7) Maximum operating temperature in degrees Fahrenheit;
(8) Construction materials;
(9) Year manufactured; and
(10) Identity of manufacturer.

(c) A primary containment system with or without an integral secondary containment system shall have wear plates (striker plates) installed, center to center, below all accessible openings. The plates shall be made of steel or other appropriate material if steel is not compatible with the hazardous substance stored. The width of the plate shall be at least eight inches on each side, or shall be equal to the area of the accessible opening or guide tube, whichever is larger. The thickness of the steel plate shall be at least 1/8 inch and those made of other materials shall be of sufficient thickness to provide equivalent protection. The plate, if under 1/4 inch thick, shall be rolled to the contours of the underground storage tank and all plates shall be bonded or tack welded in place. A drop tube-mounted bottom protector may fulfill this requirement.

(d) A secondary containment system which is not an integral part of primary containment shall be designed and constructed according to an engineering specification approved by a state registered professional engineer or according to a nationally recognized industry code or engineering standard. The engineering specification shall include the construction procedures. Materials used to construct the secondary containment system shall have sufficient thickness, density, and corrosion resistance to prevent structural weakening or damage to the secondary containment system as a result of contact with any released hazardous substance. The following requirements apply to these secondary containment systems:

(1) The secondary containment system shall be constructed to contain at least the following volumes:

(A) One hundred percent of the usable capacity of the primary containment system where only one primary container is within the secondary containment system.

(B) In the case of multiple primary containers within a single secondary containment system, the secondary containment system shall be large enough to contain 150 percent of the volume of the largest primary container within it, or 10 percent of the aggregate internal volume of all primary containers within the secondary containment system, whichever is greater. When all primary containers are completely enclosed within the secondary containment system, the restrictions of this subsection do not apply.

(2) If the secondary containment system is open to rainfall, it shall be constructed to accommodate the volume of precipitation which could enter the secondary containment system during a 24-hour, 25-year storm in addition to the volume specified in subsection (d)(1).

(3) If backfill material is placed in the secondary containment system, the volumetric requirements for the pore space shall be equal to the requirement in subsection (d)(1). The available pore space in the secondary containment system backfill shall be determined using standard engineering methods and safety factors. The specific retention and specific yield of the backfill material, the location of any primary container within the secondary containment, and the proposed method of operation for the secondary containment system shall be considered in determining the available pore space.

(4) The secondary containment system shall be equipped with a collection system to accumulate, temporarily store, and permit removal of any liquid within the system.

(5) The floor of the secondary containment system shall be constructed on a firm base and, if necessary for monitoring, shall be sloped to a collection sump. One or more access casings shall be installed in the sump and sized to allow removal of collected liquid. The access casing shall extend to the ground surface, be perforated in the region of the sump, and be covered with a locked waterproof cap or enclosed in a surface security structure that will protect the access casing(s) from entry of surface water, accidental damage, unauthorized access, and vandalism. A facility with locked gates will satisfy the requirements for protection against unauthorized access and vandalism. The casing shall have sufficient thickness to withstand all anticipated stresses with appropriate engineering safety factors and constructed of materials that will not be structurally weakened by the stored hazardous substance and will not donate, capture, or mask constituents for which analyses will be made.

(6) Secondary containment systems utilizing using membrane liners shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. A membrane liner shall contain no primary nutrients or food-like substances attractive to rodents and shall meet the requirements in Table 3.1 after a 30-day immersion in the stored hazardous substance.

(7) A membrane liner, if used, shall be installed under the direct supervision of a representative of the membrane liner fabricator or a contractor certified by the fabricator.

(8) The excavation base and walls for a membrane liner shall be prepared to the membrane liner fabricator's specifications and shall be firm, smooth, and free of any sharp objects or protrusions.

(9) The site shall be assessed to ensure that the secondary containment is always above the ground water and not in a 25-year flood plain, unless the containment and monitoring designs are for use under such conditions.

(e) Laminated, coated, or clad materials shall be considered a single wall and do not fulfill the requirements of both primary and secondary containment.

(f) Underground storage tanks with integral secondary containment systems, which satisfy the construction requirements of subsection (b), fulfill the volumetric requirements for secondary containment specified in subsection (d)(1).

(g) Underground storage tanks with secondary containment systems shall be designed and installed so that any loss of a hazardous substance from the primary containment will be detected by an interstitial monitoring device or method.

(h) An underground storage tank which contains motor vehicle fuel and which is designed with an integral secondary containment system shall provide 100 percent secondary containment unless it is equipped with the overfill prevention system in accordance with section 2635(b)(2)(C). In this case, the top portion of the tank, no greater than two feet wide along the length of the tank, may be single-walled.

(i) Tanks designed and constructed pursuant to the provisions of this section shall be monitored according to the provisions of section 2632.

Authority cited: Sections 25299.3 and 25299.7 Health and Safety Code.
Reference: Sections 25281, **25284.1** and 25291, Health and Safety Code; 40 CFR 280.20.

2635. Installation and Testing Requirements for All New Underground Storage Tanks

(a) Primary and secondary containment systems shall be designed, constructed, tested, and certified to comply, as applicable, with all of the following requirements:

(1) All underground storage tanks shall be tested at the factory before being transported. The tests shall determine whether the tanks were constructed in accordance with the applicable sections of the industry code or engineering standard under which they were built.

(2) The outer surface of underground storage tanks constructed of steel shall be protected from corrosion as follows, except that primary containment systems installed in a secondary containment system and not backfilled do not need cathodic protection:

(A) Field-installed cathodic protection systems shall be designed and certified as adequate by a corrosion specialist. The cathodic protection systems shall be tested by a cathodic protection tester within six months of installation and at least every three years thereafter. The criteria that are used to determine that cathodic protection is adequate as required by this section shall be in accordance with a code of practice developed in accordance with voluntary consensus standards. Impressed-current cathodic protection systems shall also be inspected no less than every 60 calendar days to ensure that they are in proper working order.

(B) Underground storage tanks protected with fiberglass-reinforced plastic coatings, composites, or equivalent non-metallic exterior coatings or coverings, including coating/sacrificial anode systems, shall be tested at the installation site using an electric resistance holiday detector. All holidays detected shall be repaired and checked by a factory authorized repair service before installation. During and after installation, care shall be taken to prevent damage to the protective coating or cladding. Preengineered corrosion protection systems with sacrificial anodes shall be checked once every three years in accordance with the manufacturer's instructions.

(3) Before installation, the tank shall be tested for tightness at the installation site in accordance with the manufacturer's written guidelines. If there are no guidelines, the primary and secondary containment shall be tested for tightness with air pressure at not less than 3 pounds per square-inch (20.68 k Pa) and not more than 5 pounds per square-inch (34.48 k Pa). In lieu of the above, an equivalent differential pressure test, expressed in inches of mercury vacuum, in the interstitial space of the secondary containment, is acceptable. The pressure (or vacuum in the interstitial space) shall be maintained for a minimum of 30 minutes to determine if the tank is tight. If a tank fails the tightness test, as evidenced by soap bubbles, or water droplets, installation shall be suspended until the tank is replaced or repaired by a factory authorized repair service. Following repair or replacement, the tank shall pass a tightness test.

(4) All secondary containment systems shall pass a post-installation test which meets the approval of the local agency.

(5) After installation, but before the underground storage tank is placed in service, a tank integrity test shall be conducted to ensure that no damage occurred during installation. The tank integrity test is not required if the tank is equipped with an interstitial monitor certified by a third-party evaluator to meet the performance standards of a "tank integrity test" as defined in section 2611, or if the tank is tested using another method deemed by the State Water Resources Control Board to be equivalent.

(6) All underground storage tanks shall be installed according to a code of practice developed in accordance with voluntary consensus standards and the manufacturer's written installation instructions. The owner or operator shall certify that the underground storage tank was installed in accordance with the above requirements as required by subsection (d) of this section.

(7) All underground storage tanks subject to flotation shall be anchored using methods specified by the manufacturer or, if none exist, shall be anchored according to the best engineering judgment.

(b) All underground storage tanks shall be equipped with a spill container and an overfill prevention system as follows:

(1) The spill container shall collect any hazardous substances spilled during product delivery operations to prevent the hazardous substance from entering the subsurface environment. The spill container shall meet the following requirements:

(A) If it is made of metal, the exterior wall shall be protected from galvanic corrosion.
(B) It shall have a minimum capacity of five gallons (19 liters).
(C) It shall have a drain valve which allows drainage of the collected spill into the primary container or provide a means to keep the spill container empty.

(2) The overfill prevention system shall not allow for manual override and shall meet one of the following requirements:

(A) Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or

(B) Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm sounds at least five minutes before the tank overfills; or

(C) Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or,

(D) Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

(3) The local agency may waive the requirement for overfill prevention equipment where the tank inlet exists in an observable area, the spill container is adequate to collect any overfill, and the tank system is filled by transfers of no more than 25 gallons at one time.

(c) Secondary containment systems including leak interception and detection systems installed pursuant to section 2633 shall comply with all of the following:

(1) The secondary containment system shall encompass the area within the system of vertical planes surrounding the exterior of the primary containment system. If backfill is placed between the primary and secondary containment systems, an evaluation shall be made of the maximum lateral spread of a point leak from the primary containment system over the vertical distance between the primary and secondary containment systems. The secondary containment system shall extend an additional distance beyond the vertical planes described above equal to the radius of the lateral spread plus one foot.

(2) The secondary containment system shall be capable of preventing the inflow of the highest ground water anticipated into the interstitial space during the life of the tank.

(3) If the interstitial space is backfilled, the backfill material shall not prevent the vertical movement of leakage from any part of the primary containment system.

(4) The secondary containment system with backfill material shall be designed and constructed to promote gravity drainage of an unauthorized release of hazardous substances from any part of the primary containment system to the monitoring location(s).

(5) Two or more primary containment systems shall not use the same secondary containment system if the primary containment systems store materials that in combination may cause a fire or explosion, or the production of a flammable, toxic, or poisonous gas, or the deterioration of any part of the primary or secondary containment system.

(6) Drainage of liquid from within a secondary containment system shall be controlled in a manner approved by the local agency to prevent hazardous materials from being discharged into the environment. The liquid shall be analyzed to determine the presence of any of the hazardous substance(s) stored in the primary containment system prior to initial removal, and monthly thereafter, for any continuous discharge (removal) to determine the appropriate method for final disposal. The liquid shall be sampled and analyzed immediately upon any indication of an unauthorized release from the primary containment system.

(7) For primary containment systems installed completely beneath the ground surface, the original excavation for the secondary containment system shall have a water-tight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as water-tight as practical. Primary containment systems with integral secondary containment and open vaults are exempt from the requirements of this subsection.

(8) The actual location and orientation of the tanks and appurtenant piping systems shall be indicated on as-built drawings of the facility. Copies of all drawings, photographs, and plans shall be submitted to the local agency for approval.

(d) Owners or their agents shall certify that the installation of the tanks and piping meets the conditions in subdivisions (1) through (5) below. The certification shall be made on a "Certificate of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(1) The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers. **On and after July 1, 2001, ~~t~~This certification shall be renewed** ~~every 36 months upon~~ **by completion of refresher training provided by the manufacturer. Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.**

(2) The installer has been certified or licensed by the Contractors State License Board;

(3) The underground storage tank, any primary piping, and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions;

(4) All work listed in the manufacturer's installation checklist has been completed; and

(5) The installation has been inspected and approved by the local agency, or, if required by the local agency, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1, 25291** and 25299, Health and Safety Code; 40 CFR 280.40 - 280.45.

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping ~~and Under-dispenser Containment.~~

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems shall be sloped so that all releases will flow to a collection sump located at the low point of the underground piping.

(2) Primary piping and secondary containment systems shall be installed in accordance with an industry code of practice developed in accordance with voluntary consensus standards. The owner or operator shall certify that the piping was installed in accordance with the above requirements of section 2635(d). The certification shall be made on the "Certification of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(d) Lined trench systems used as part of a secondary containment system shall be designed and constructed according to a code of practice or engineering standard approved by a state registered professional engineer. The following requirements shall also apply:

(1) All trench materials shall be compatible with the substance stored and evaluated by an independent testing organization for their compatibility or adequacy of the trench design, construction, and application.

(2) The trench shall be covered and capable of supporting any expected vehicular traffic.

(e) All new primary piping and secondary containment systems shall be tested for tightness after installation in accordance with manufacturer's guidelines. Primary pressurized piping shall be tested for tightness hydrostatically at 150 percent of design operating pressure or pneumatically at 110 percent of design operating pressure. If the calculated test pressure for pressurized piping is less than 40 psi, 40 psi shall be used as the test pressure. The pressure shall be maintained for a minimum of 30 minutes and all joints shall be soap tested. A failed test, as evidenced by the presence of bubbles, shall require appropriate repairs and retesting. If there are no manufacturer's guidelines, secondary containment systems shall be tested using an applicable method specified in an industry code or engineering standard. Suction piping and gravity flow piping which cannot be isolated from the tank shall be tested after installation in conjunction with an overfilled volumetric tank integrity test, or other test method meeting the requirements of section 2643(f), if approved by the local agency.

(f) Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems as follows:

(1) All ~~The~~ secondary containment, including under-dispenser containment, *and under-dispenser spill control or containment systems* ~~, system~~ shall be equipped with a continuous monitoring system that either activates ~~which meets the requirements of section 2643(f) and which is connected to~~ an audible and visual alarm ~~system~~ or stops the flow of product at the dispenser when it detects a leak.

(2) Automatic line leak detectors shall be installed on underground pressurized piping and shall be capable of detecting a 3-gallon per hour leak rate at 10 psi within 1 hour with a probability of detection of at least 95 percent and a probability of

false alarm no greater than 5 percent. ~~Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.~~

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section. ~~A~~ C~~c~~ontinuous monitoring systems as described in subdivision (1), which shuts down the pump in addition to either activating the audible and visual alarm ~~system~~ or stopping the flow of product at the dispenser, satisfy~~ies~~ the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure of the product piping system at the test pressure with at least a 95 percent probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) All ~~The~~ secondary containment systems ~~is~~ are equipped with ~~a~~ continuous monitoring systems. The leak detection device may be located at the pump sump for sections of ~~if~~ the piping that slopes back to this point.

(2) All ~~A~~ continuous monitoring systems ~~is~~ for the piping are connected to ~~an audible and visual alarm system and~~ the pumping system.

(3) All ~~A~~ continuous monitoring systems for the piping shuts down the pump and either activates an audible and visual ~~the~~ alarm ~~system~~ or stop the flow of product at the dispenser when they detect a leak ~~a release is detected~~.

(4) The pumping system shuts down automatically if any of the continuous monitoring systems for the piping fail or are ~~is~~ disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:

(1) Owners or Operators of a UST system shall have the system fitted with **under-dispenser containment, or an approved *under*-dispenser spill containment or control system according to the following schedule:**

(A) **At the time of installation for systems installed after January 1, 2000.**

(B) **By July 1, 2001, for systems installed after July 1, 1987 that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state ~~notified by the board according to its~~ Geographic Information System mapping database.**

(C) **By December 31, 2003, for systems not subject to subsection 2636(h)(1)(A) or (B).**

(2) **Under-dispenser containment ~~must~~ shall be designed, constructed, installed, and monitored in accordance with section 2631, 2636(c)(2), 2636(e), and 2636(f).** ~~Separate monitoring for under-dispenser containment is not required if the lowest point of the under-dispenser containment drains to a monitoring point within the connected piping system.~~

(3) **A manufacturer of a*n under*-dispenser spill containment or control system may apply to the Division of Clean Water Programs Underground Storage Tank Program Manager for approval of the system. Owners or operators shall not install a*n under*-dispenser spill containment or control system that has not been approved.**

(A) **Applications for approval shall be submitted in writing and include the following:**

(i) **A description of the proposed system.**

(ii) **Clear and convincing evidence that the system will protect the soil and beneficial uses of the waters of the state from unauthorized releases.**

(B) **The Program Manager shall review the application to determine if the proposed system adequately protects the soil and beneficial uses of groundwater before determining whether to approve the proposed system.**

(C) **The Program Manager may modify or revoke a previously issued approval if it finds that, based on new evidence, the approved system does not adequately protect the soil and beneficial uses of groundwater from unauthorized releases.**

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1**, 25291 and 25299, Health and Safety Code; 40 CFR 280.20, 280.40-280.45.

Amend Title 23, Division 3, Chapter 16, Article 3, to add new sections 2636.1, 2636.2, 2636.3, 2636.4 and 2637 of the California Code of Regulations as follows:

2636.1. Final Division Decisions Regarding *Under*-Dispenser Spill Containment or Control Systems

(a) A manufacturer of a*n under*-dispenser spill containment or control system who disagrees with a determination by the Program Manager not to approve the manufacturer's system under section 2636(h)(3)(B) or to modify or revoke a previously issued approval of the manufacturer's system under section 2636(h)(3)(C) may ask for a review by the Division Chief.

(b) An appeal to the Division Chief must be in writing and must be accompanied by all material that the manufacturer wishes to be considered by the Division Chief, and by the Board in any subsequent review by the Board. The appeal must contain an explanation why the manufacturer believes the Program Manager's determination is erroneous, inappropriate, or improper.

(c) The Division Chief shall render a Final Division Decision within 30 days of receipt of the appeal. A Final Division Decision is final and conclusive unless the manufacturer files a petition for review with the Board that is received by the Board within 30 days from the date of the Final Division Decision.

(d) The Division Chief may at any time, on the Division Chief's own motion, issue a Final Division Decision.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.2. Petition for Board Review Regarding *Under*-Dispenser Spill Containment or Control Systems

(a) A manufacturer may petition the Board for review of a Final Division Decision.

(b) A petition for Board review shall contain the following:

(1) The name and address of the petitioner;

(2) *A statement of the date on which the petitioner received the Division's final* decision;

(3) A copy of the Final Division Decision that the Board is requested to review;

(4) An explanation why the petitioner believes the Final Division Decision is erroneous, inappropriate, or improper;

(5) A statement describing how the petitioner is damaged by the Final Division Decision; and

(6) A description of the remedy or outcome desired.

(c) The petition shall be sent to the Board Chairperson, with copies sent to the Chief Counsel of the Board, and the Division Chief.

(d) The petitioner may request a hearing for the purpose of presenting factual material not presented to the Division Chief or for oral argument or both. The request to present material that was not presented to the Division Chief must include a description of the factual material that the petitioner wishes to submit, the facts that the petitioner expects to establish, and an explanation of the reasons why the petitioner could not previously submit the new material to the Division Chief. The petitioner must include with the petition a copy of any new documentary material that the petitioner wishes to present to the Board.

(e) The Division Chief may file a response to the petition with the Board within 30 days of the Board's notification to the petitioner that the petition is complete. The Division must provide a copy of any response to the petitioner. The Board may extend the time for filing a response by the Division Chief.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.3. Defective Petitions

Upon the Board's receipt of a petition which does not comply with section 2636.2 of this chapter, the Board, through its Chief Counsel, will advise the petitioner of the manner in which the petition is defective and allow a reasonable time within which an amended petition may be filed. If the Board does not receive a properly amended petition within the time allowed, the petition shall be dismissed.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.4. Action by the Board Regarding *Under*-dispenser Spill Containment or Control Systems

(a) In response to the petition, the Board may:

(1) Refuse to review the petition if it is late or fails to raise substantial issues that are appropriate for Board review;

(2) Affirm the final decision that the Board has been requested to review;

(3) Set aside or modify the final decision that the Board has been requested to review; or

(4) Take such other action as the Board deems appropriate.

(b) Before taking action, the Board may, at its discretion, hold a hearing, or provide for an informal meeting between the petitioner, the Division Chief, a member of the Board, and such other persons as the Board deems appropriate for the purpose of attempting to resolve the dispute.

(c) If an evidentiary hearing is held, it shall be conducted in accordance with the California Code of Regulations, title 23, division 3, Chapter 1.5, article 2.

(d) The Board reserves the right, at its discretion, to consider a petition upon its own motion.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2637. Secondary Containment Testing and Annual Maintenance Certification

(a) Secondary containment systems installed o~~O~~n *or after January 1, 2001* ~~all secondary containment of underground storage tank systems, including, but not limited to, open secondary containment, lined trench systems, under-dispenser containment, and sumps,~~ shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 200~~2~~3 and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) By December 31, 2002, t~~T~~he owner or operator of any secondary containment system that the owner or operator determines cannot be tested in accordance with this section shall replace the secondary containment system with a system that can be tested in accordance with this section. As an alternative, the owner or operator may submit a proposal and workplan for enhanced leak detection to the local agency in accordance with subdivisions 2644.1 (a)(1), (2), (4), and (5) by July 1, 2002; complete the program of enhanced leak detection by December 31, 2002; and replace the secondary containment system with a system that can be tested in accordance with this section by July 1, 2005. ~~, in accordance with subsections 2644.1(a)(1), (2), (4), and (5), submit a proposed program of enhanced leak detection to the local agency by October 1, 2001.~~ The local agency *shall* review the proposed program of enhanced leak detection within ~~*30*~~ *45* days of submittal or re-submittal. ~~After approval by the local agency, the owner or operator shall implement the program no later than January 1, 2002. Additionally, the owner or operator shall replace this secondary containment~~

~~with a system that can be tested in accordance with this section on or before July 1, 2005.~~

(2) Periodic testing of ~~s~~Secondary containment systems shall ~~must be tested to test criteria no less stringent than those used at installation.~~ be conducted using a test procedure that demonstrates that the system performs at least as well as it did upon initial installation. For example, if the secondary containment was tested upon installation by using a test method that applied a pressure of 5psi, then the periodic test must be conducted using a method that tests the system at an equivalent pressure. These tests shall be performed ~~. Additionally, secondary containment systems shall be tested~~ in accordance with manufacturer's guidelines ~~and~~ or standards. If there are no manufacturer's guidelines or standards, secondary containment systems ~~must~~ shall be tested using an applicable method specified in an industry code or engineering standard. If there are no manufacturers guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer shall be used. ~~In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.~~

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002 the following shall also apply: ~~annual certification of monitoring equipment shall be conducted as follows:~~

(1) Persons ~~A person~~ performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment ~~the annual monitoring equipment certification~~ shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer ~~upon~~ by *completion* of a manufacturer's refresher course. ~~every 36 months.~~ Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Individuals employed by persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment for the purpose of conducting this work shall meet the requirements of 2637(b)(1)(B) and (C).

~~(2)~~ *(3)* Annual ~~The~~ monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

~~(3)~~ *(4)* UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of *the inspection.*

~~(4)~~ *(5)* The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency

~~(5)~~ *(6)* A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

(2) Any period during which hazardous substances are stored in the tank, and no filling or withdrawal is conducted; and

(3) Any period between cessation of the storage of hazardous substances and the actual completion of closure, pursuant to Article 7, unless otherwise specified by the local agency, pursuant to section 2671(b), during a temporary closure period.

(c) This article shall not apply to underground storage tanks that are designed, constructed, installed, and monitored in accordance with **~~sections 2631 and 2632 or 2633 and 2634 of~~** Article 3.

(d) Owners or operators of tanks monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code shall comply with the requirements of section 2645. Tank systems having a capacity of more than 2,000 gallons shall not be monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code.

(e) **An owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well , as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1. Additionally, the following conditions for enhanced leak detection shall apply:**

(1) **For the purpose of section 2644.1, vent or tank riser piping, vapor recovery piping, and suction piping that meet the definitions of section 2636(a)(1), (2), or (3), are not considered single-walled components.**

(2) **Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 60 ~~90~~ calendar days of the date ~~of~~ the notification was mailed. ~~The Program Manager shall make a decision on the request within 30 calendar days of receipt of the request~~** ***The Program Manager shall make a decision on the request, and notify the applicable local agency of this decision, within 90 calendar days of receipt of the request.***

(3) **The request for reconsideration must include the name and address of the subject facility, the name and address of the owner or operator submitting**

the request, and the reason(s) why the requester believes the board notification was in error. If *the request is based* on evidence ~~a belief~~ *that the* UST system in question is greater than 1,000 feet from a public drinking water well, the request shall include a demonstration that the center of the well head is more than 1,000 ft from the closest component of the UST system ~~a sealed map showing the location of the subject UST system and the location of the nearest public drinking water well.~~ If the request is based on evidence ~~a determination~~ that the subject UST system does not have a single-walled component, the request shall include supporting documentation. A copy of the request shall be concurrently submitted to the local agency.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25292 and **25292.4,** Health and Safety Code; 40 CFR 280.40, 280.42 and 280.43(b).

2641. Monitoring Program Requirements

(a) Owners or operators of existing underground storage tanks subject to this article shall implement a monitoring program which is capable of detecting an unauthorized release from any portion of the underground storage tank system at the earliest possible opportunity.

(b) Underground piping shall be exempt from monitoring requirements if the local agency determines that the piping has been designed and constructed in accordance with section 2636(a)(3).

(c) All underground piping that operates at less than atmospheric pressure, unless it is exempt from monitoring under subsection (b), shall comply with the monitoring requirements of section 2643(d) and shall also include daily monitoring as described in Appendix II.

(d) All portions of the underground storage tank system shall be visually monitored in accordance with section 2642. A portion of the underground storage tank shall be exempt from visual monitoring if the owner demonstrates to the satisfaction of the local agency that one or more of the following conditions apply to that portion:

(1) It is not accessible for direct viewing;

(2) Visual inspection would be hazardous or would require the use of extraordinary personal protection equipment other than normal protective equipment such as steel-toed shoes, hard hat, or ear protection; or

(3) The underground storage tank is located at a facility which is not staffed on a daily basis.

(e) Non-visual monitoring shall be implemented for all portions of the underground storage tank which are exempt under subsection (d) and, for the underground storage tank, during periods when visual monitoring required under subsection (d) is not conducted. This non-visual monitoring shall include a quantitative release detection method as specified in section 2643 or a qualitative release detection method as specified in section 2644 or a combination of these methods as approved by the local agency.

(f) Non-visual monitoring for underground pressurized piping shall include a quantitative release detection method that complies with the performance requirements in section 2643(c)(1).

(g) The monitoring program shall be approved by the local agency and shall be in compliance with the requirements of this article and with the underground storage tank operating permit. The local agency may require additional monitoring methods specified in the operating permit or more frequent monitoring as necessary to satisfy the objective in subsection (a). In deciding whether to approve a proposed monitoring program, or to require additional methods or more frequent monitoring, the local agency shall consider the following factors:

(1) The volume and physical and chemical characteristics of the hazardous substance(s) stored in the underground storage tank;

(2) The compatibility of the stored hazardous substance(s) and any chemical-reaction product(s) with the function of monitoring equipment or devices;

(3) The reliability and consistency of the proposed monitoring equipment and systems under site-specific conditions;

(4) The depth and quantity of ground water and the direction of ground water flow;

(5) The patterns of precipitation in the region and any ground water recharge which occurs as a result of precipitation;

(6) The existing quality of ground water in the area, including other sources of contamination and their cumulative impacts;

(7) The current and potential future uses (e.g., domestic, municipal, agricultural, industrial supply) of ground water in the area;

(8) The proximity and withdrawal rates of ground water users in the area;

(9) The type, homogeneity, and range of moisture content of the backfill material and native soils and their probable effects on contaminant migration and detection;

(10) The presence of contamination in the excavation zone or surrounding soils;

(11) The proximity of the underground storage tank to surface waters; and

(12) Additional hydrogeologic characteristics of the zone surrounding the underground storage tank.

(h) The monitoring program shall include written monitoring procedures and a response plan as set forth in section 2632(d).

(i) If the local agency does not approve the monitoring program, the owner or operator shall replace, repair, upgrade, or close the tank in accordance with the applicable provisions of this chapter and local agency approval.

(j) Equipment and devices used to monitor underground storage tanks shall be installed, calibrated, operated, and maintained in accordance with <u>section 2637(b).</u> ~~manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.~~

(k) When an unauthorized release is indicated during the installation of a release detection system, the owner or operator shall comply with the release reporting requirements of Article 5 and, if the release came from the existing tank, shall cease the installation process until the tank system is replaced, repaired, upgraded, or closed in accordance with the applicable provisions of this chapter.

(l) When implementation of the monitoring program, or any condition, indicates that an unauthorized release may have occurred, the owner or operator shall comply with the release reporting requirements of Article 5 and shall replace, repair, or close the underground storage tank in accordance with the applicable provisions of this chapter.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25283, <u>25284.1</u>, 25291 and 25292 Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, to add new section 2644.1 of the California Code of Regulations as follows:

<u>2644.1 Enhanced Leak Detection</u>

<u>(a) An owner or operator who is required, pursuant to section 2640(e), to implement a program of enhanced leak detection or monitoring shall comply with the requirements of this section as follows:</u>

<u>(1) Enhanced leak detection means a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system.</u>

<u>(2) The enhanced leak detection test method shall be third party certified, in accordance with section 2643(f), for the capability of detecting both vapor and liquid phase releases from the underground storage tank system. The enhanced leak detection test method shall be capable of detecting a leak rate of at least ~~0.05~~ 0.005 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.</u>

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the local agency within 6 months following notification by the board The enhanced leak detection shall be implemented no later than ~~12~~ 18 months following receipt of notification from the board and repeated every 36 months thereafter.

(3) Owners and operators of underground storage tanks subject to the requirements of this section must notify the local agency at least 48 hours prior to conducting the enhanced leak detection test unless this notification requirement is waived by the local agency.

(4) **Owners and operators of underground storage tanks subject to the requirements of this section shall submit a copy of the enhanced leak detection test report to the board and the local agency within 60 days of completion of the test.**

Authority cited: Sections 25299.3, and 25299.7, Health and Safety Code.
Reference: Sections 25283, 25291, 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows:

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping ~~and dispensers.~~

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998. ~~Upgrade requirements for dispensers shall be completed no later than December 31, 2003.~~ ***Requirements for under-dispenser containment, or under-dispenser spill control or containment systems, shall be completed no later than December 31, 2003.***

(i) As a preventive measure, an owner or operator may upgrade any underground storage tank constructed of any material which is not under pressure and which contains motor vehicle fuel as specified in sections 2662(a), (c), and (e). Before upgrading in accordance with this subsection, the owner or operator shall prove to the satisfaction of the local agency that the underground storage tank system has not caused an unauthorized release. If soil samples are taken, the owner or operator shall notify the local agency in advance of taking the samples.

(j) Owners or operators shall maintain records of repairs, linings, and upgrades that demonstrate compliance with the requirements of this article for the remaining operating life of the tank.

(k) Local agencies shall not approve a repair or upgrade unless it can be demonstrated that the underground storage tank system is structurally sound and the method of repair or upgrade will prevent unauthorized releases due to structural failure or corrosion during the operating life of the underground storage tank system.

(l) The materials used in the repair or upgrading process shall be applied in accordance with nationally recognized engineering practices.

(m) Materials used in repairs and upgrades shall be compatible with the existing underground storage tank system materials and shall not be subject to deterioration due to contact with the hazardous substance being stored.

(n) Steel underground storage tanks that exhibit external corrosion during the course of repair or upgrade shall comply with the cathodic protection requirements of section 2635(a)(2).

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections **25284.1**, 25292, 25292.1 and 25296, Health and Safety Code; 40 CFR 280.21, 280.33 and 281.32(d)

2666. Requirements for Upgrading Underground Piping ~~and Dispensers~~

(a) By December 22, 1998, all underground piping containing hazardous substances other than motor vehicle fuel shall be retrofitted with secondary containment meeting the requirements of section 2636.

(b) By December 22, 1998, all underground piping containing motor vehicle fuel and connected to an existing tank shall be retrofitted with secondary containment unless the owner or operator demonstrates to the local agency that the piping is constructed of fiberglass reinforced plastic, cathodically protected steel, or other materials compatible with stored products and resistant to corrosion. The secondary containment system shall meet the construction, installation, and monitoring requirements of section 2636.

(c) By December 22, 1998, all automatic line leak detectors for underground pressurized piping which is not secondarily contained shall be capable of shutting off the pump when a release occurs. In addition, the pumping system shall shut down automatically if the automatic line leak detector fails or is disconnected. In lieu of the above, for underground storage tank emergency generator systems, the leak detector must be connected to an audible and visible alarm to indicate a release or malfunction of the system.

(d) All underground piping and secondary containment shall be tested for tightness after installation in accordance with section 2636(e).

(e) By December 31, 2003, all existing underground storage tanks shall be retrofitted with under-dispenser containment, or a*n under-*dispenser spill containment or control system. The under-dispenser containment or *under-*dispenser spill containment or control system shall meet, where applicable, the requirements of 2636(h)(2), or 2636(h)(3).

Authority cited : Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section **25284.1**, 25292 and 25292.1, Health and Safety Code; 40 CFR 280.21.

STATE WATER RESOURCES CONTROL BOARD WORKSHOP AGENDA

Wednesday, January 31, 2001 – 9:00 a.m.

First-Floor Hearing Room
Paul R. Bonderson Building
901 P Street, Sacramento

Questions regarding this agenda call Maureen Marché (916) 341-5600 or fax 341-5620. This notice and associated staff reports can be accessed electronically through our Internet address: http://www.swrcb.ca.gov. (Note: agenda items should be available electronically on January 24, 2001.)

Workshop includes informal discussion of items to be presented for action at a future business meeting. People who are interested in items on the agenda are urged to attend workshops as they may miss valuable discussion that will not be repeated at the Board meeting. NOTE: There is no voting at workshops. Items requiring Board action must come to a Board meeting.

Please note time limitations on presentations may be imposed.
The State Board requests that oral testimony be summarized.
Submittal of written comments is encouraged to ensure
that all comments will be included in the
record before the Board.*

ITEMS 1-13 WILL BE DISCUSSED STARTING AT 9:00 A.M., WEDNESDAY, JANUARY 31, 2001

(Note: Item 8 will not be discussed before 11:00 a.m.

PUBLIC FORUM

Any member of the public may address and ask questions of the Board relating to any matter within the Board's jurisdiction, provided the matter is not on the Board's agenda or pending before the Board or a Regional Board. *Note: Presentations at the Public Forum will be limited to 5 minutes or otherwise at the discretion of the Chairman.*

CLEAN WATER PROGRAMS

1. Consideration of Approval of Adoption of Emergency Regulations for Electronic Submission of Laboratory Analytical Data for Underground Storage Tank (UST) Reports. (The Board will consider, at a Board meeting, whether to adopt the proposed resolution to enact the emergency regulations.)

2. Consideration of Approval of Adoption of Proposed Regulations to Implement Amendments to Chapter 6.7 of the Health and Safety Code Enacted Through Senate Bill 989. (The Board will consider, at a Board meeting, whether to adopt the proposed resolution adopting amendments to the Underground Storage Regulations.)

****3. Consideration of Approval to Increase the Small Community Grant (SCG) Eligibility Percentage for the City of Plymouth.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution for approval of the 1995 Income Survey.)

****4. Consideration of Approval to Reauthorize State Revolving Fund (SRF) Loan Commitments for the Los Angeles County Sanitation District's (LACSD) Joint Water Pollution Control Plant (JWPCP) Upgrade and Santa Ana Watershed Project Authority's (SAWPA) Temescal Valley Regional Interceptor (TVRI) Project.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution reauthorizing SRF loan funding for the LACSD-JWPCP and the SAWPA-TVRI projects.)

****5. Consideration of Approval of a Time Extension for the City of Beaumont for a Grant from the Water Recycling Facilities Planning Grant Program.** (The Board will consider, at a Board meeting, whether to approve the resolution to extend the time for study completion.)

****6. Consideration of Approval of a State Revolving Fund (SRF) Loan for the City of Rosamond Wastewater Treatment Plant Expansion Project No. C-06-4148-110.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution for approval of the preliminary SRF.)

--over--

CLEAN WATER PROGRAM PETITIONS (Note: Item 8 will not be discussed before 11:00 a.m.)
~~**7. In the Matter of the Petition of Carroll Belcher, Paul Burgener, Alfredo Fajardo, Manuel Lovio, Christobal Marcos, Roy Cory Oviedo, Jordan Siplon, Rolando Umali, and Nicanor Valdejueza (Appellants) for Review of a Determination by the Division of Clean Water Programs Regarding Denial of Operator-In-Training Wastewater Treatment Plant Certificates.** (The Board will consider, at a Board meeting, whether to adopt the proposed order upholding the Division's decision.)~~ This item has been postponed

8. In the Matter of the Petition of G.W. Singletary for Review of a Determination of the Division of Clean Water Programs, State Water Resources Control Board, Finding Petitioner Ineligible to Participate in the Underground Storage Tank Cleanup Fund. SWRCB/OCC File UST-145. (The Board will consider, at a Board Meeting, whether to adopt the proposed order upholding the Division's decision.)

WATER QUALITY PETITIONS
9. In the Matter of the Petition of the County of San Diego, San Marcos Landfill for Review of Assessment of Administrative Civil Liability Order No. 2000-82, Issued by the California Regional Water Quality Control Board, San Diego Region. SWRCB File A-1302. (The Board will consider, at a Board meeting, whether to adopt the proposed order granting the petition in part and remanding the matter to the Regional Water Board for further findings and modifications consistent with this order.)

10. In the Matter of the Petition of the City of Los Angles for Review of Assessment of Administrative Civil Liability Order No. 99-102, Issued by the California Regional Water Quality Control Board, Los Angeles Region. SWRCB File A-1295. (The Board will consider, at a Board meeting, whether to adopt the proposed order granting the petition in part and remanding the matter to the Regional Water Board for further findings and modifications consistent with this order.)

11. In the Matter of the Petition of Las Virgenes Municipal Water District for Review of Waste Discharge Requirements Order No. 99-142, Issued by the California Regional Water Quality Control Board, Los Angeles Region. SWRCB File A-1263. (The Board will consider, at a Board meeting, whether to adopt the proposed order amending Order No. 99-142.)

WATER RIGHTS
****12. Consideration of a Resolution Authorizing the Executive Director to Enter into an Agreement with the Monterey County Water Resources Agency to Provide Funding for Conducting Investigations to Support a Physical Solution or, if Necessary, State Adjudication to Address the Seawater Intrusion Problem.** (The Board will consider, at a future board meeting, whether to adopt the proposed resolution approving the interagency agreement in the amount of $600,000 over an eighteen-month period.)

WATER QUALITY
****13. Consideration of a Resolution Delegating to the Executive Director Authority to Negotiate, Execute, and Amend Contracts Supporting Total Maximum Daily Load Work.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution.)

Closed Session Items
(Please note Closed Sessions are not open to the public)
(This is authorized under Government Code section 11126(c)(3).

WATER RIGHTS
The Board will be meeting in closed session to deliberate on a proposed decision regarding Application 30532 of Monterey County Water Resources Agency to divert 27,900 acre feet to storage in Nacimiento Reservoir in San Luis Obispo County.

The Board will be meeting in closed session to deliberate on a proposed decision to be reached regarding the protection of fishery resources and other issues relating to the diversion and use of water from the lower Yuba River.

The Board will be Meeting in Closed Session to Deliberate Whether to Adopt a Water Right Decision Approving Water Right Applications for the Delta Wetlands Project.

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*In order to be fully considered at the meeting, all written comments must be received by 5:00 p.m., January 29, 2001. Mailing address: PO Box 100, Sacramento, CA 95812-0100; FAX 916-341-5620

**These items are expected to be routine and noncontroversial and there will be no discussion unless requested by a Board Member, staff or interested party. If such a request is made, the item will be considered separately.

Note: A quorum of the Board will be meeting with key staff at the Asilomar Conference Center on February 1-2, 2001 to discuss internal priority and planning issues.

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2001 - 024

APPROVAL OF PROPOSED REVISED REGULATIONS GOVERNING UNDERGROUND STORAGE TANKS

WHEREAS:

1. The Legislature enacted Health and Safety Code Chapter 6.7 to establish orderly procedures that will ensure that underground storage tanks meet appropriate standards and are installed, maintained, inspected, tested, and upgraded so that the health, property, and resources of the people of the state will be protected.

2. The SWRCB administers the Underground Storage Tank (UST) Program, and local agencies implement the program through UST permitting and enforcement.

3. Health and Safety Code section 25299.33 of chapter 6.7 authorizes the SWRCB to adopt regulations to implement chapter 6.7.

4. In October 1999, the Legislature amended chapter 6.7 by enacting Senate Bill 989 (stats.1999, ch 812).

5. On May 12, 2000 the SWRCB published a notice of proposed rulemaking to implement, interpret, and clarify the recent amendments to chapter 6.7, and on July 18, 2000 held a public hearing regarding the proposed regulations.

6. The SWRCB received several written and/or oral comments and, based on the accepted comments and on SWRCB initiated changes, the proposed regulations were revised and re-noticed to commenters for further comments for 15 days. Additional comments were received during the 15-day notice, and the SWRCB revised the regulations in response to these comments and re-noticed the changes. This process was repeated for a third and final 15-day notice. Although additional comments were received during the last 15-day comment period, the SWRCB rejected all of these comments and no further revisions were made to the proposed regulations. prior to the January 31, 2001 SWRCB board workshop.

   However, at the SWRCB board workshop on January 31, 2001 the board directed SWRCB staff to make non-substantial changes to subdivision 2637(a)(2), in response to oral comments presented at the workshop. Staff have made these changes as directed.

7. The SWRCB has determined that it is appropriate and desirable to amend the Underground Storage Tank regulations identified in the notice of proposed rulemaking, the 15-day notice of change of text, and the final statement of reasons, and that no revisions to the amendments are necessary in light of the final public comments received.

THEREFORE BE IT RESOLVED THAT:

The State Water Resources Control Board adopts the proposed amendments to the Underground Storage Tank regulations to implement, interpret, and make specific chapter 6.7 of the Health and Safety Code, which will become effective as provided by the California Administrative Procedure Act upon approval by the Office of Administrative Law and filing with the Secretary of State, and directs the Executive Director to submit the proposed amendments to the Office of Administrative Law for approval.

CERTIFICATION

The undersigned, Adminstrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 15, 2001.

Maureen Marché

Maureen Marché
Administrative Assistant to the Board

I. TRANSMITTAL LETTERS

Winston H. Hickox
Secretary for Environmental Protection

State Water Resources Control Board

Executive Office
1001 I Street, Sacramento, California 95814
P.O. Box 100, Sacramento, California 95812-0100
(916) 341-5615 ♦ FAX (916) 341-5621 ♦ www.swrcb.ca.gov

Gray Davis
Governor

TO: David C. Judson, Deputy Director
Office of Administrative Law
555 Capitol Mall, Suite 1290
Sacramento, CA 95814-4602

FROM: Edward C. Anton
Acting Executive Director
EXECUTIVE OFFICE

DATE: MAR 30 2001

SUBJECT: PROPOSED AMENDMENTS TO CHAPTER 16, UNDERGROUND STORAGE TANK REGULATIONS

The State Water Resources Control Board (SWRCB) is proposing to amend chapter 16, division 3, title 23 of the California Code of Regulations (commencing with section 25280), relating to construction and monitoring of underground storage tanks.

Amendments to the underground storage tank regulations are being proposed to interpret, clarify, and make specific legislative changes made to chapter 6.75 of the Health and Safety Code pursuant to chapter 812, statutes of 1999 (Sher) (Senate Bill 989). The proposed amendments are being sent to you for your review and subsequent filing with the Secretary of State's Office. We request that the proposed regulations become effective on the date of filing. Attached are seven copies of the regulations with a copy of the Std. 400 attached to the front of each copy, and the complete rulemaking file with index and sworn statement. Minor non-substantial changes were made to subdivision 2635 (d) and to the monitoring and certification form (format changes) after adoption by the board on February 15, 2001.

If you have any questions please contact Charles NeSmith at (916) 227-4377.

Attachments

State Water Resources Control Board

Division of Clean Water Programs
2014 T Street • Sacramento, California 95814 • (916) 227-4701
Mailing Address: P.O. Box 944212 • Sacramento, California • 94244-2120
Internet Address: http:/www.swrcb.ca.gov/~cwphome/ustcf
FAX (916) 227-4530

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

TO: Walt Pettit
Executive Director
EXECUTIVE OFFICE

ORIGINAL SIGNED BY

FROM: Edward C. Anton, Chief
DIVISION OF CLEAN WATER PROGRAMS

DATE: MAR 30 2000

SUBJECT: AMENDMENTS TO TITLE 23, CHAPTER 16, CALIFORNIA CODE OF REGULATIONS (CCR) – UNDERGROUND STORAGE TANK REGULATIONS

We are resubmitting, for your review and signature, the attached regulation package which relates to amendments to CCR Title 23, Chapter 16, underground storage tank regulations, because several significant revisions were made to the original regulation package after your signature dated February 7, 2000. These revisions include: 1) four new sections (2636.1, 2636.2, 2636.3, and 2636.4) that provide extensive detail regarding owner/operator petitions relating to SWRCB approval of dispenser containment and control systems; and, 2) an updated fiscal and economic impact analysis in response to questions and comments from the Department of Finance, the SWRCB budget office, and the SWRCB economics unit.

Amendments to the underground storage tank regulations are being proposed to interpret, clarify, and implement legislative changes made to chapter 6.75 of the Health and Safety Code pursuant to chapter 812, statutes of 1999 (Sher) (Senate Bill 989). These amendments to Title 23 will:

1. Require UST owners or operators to conduct triennial testing of UST secondary containment systems, including testing of under-dispenser containment;

2. Require UST owners or operators of UST systems, which have a single-walled component and are located within 1000 feet of a public drinking water well, to conduct triennial enhanced leak detection. This enhanced leak detection must be a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

3. Require all UST owners and operators, including those who own or operate single-walled UST systems, to install under-dispenser containment by December 31, 2003. Some UST systems must have the under-dispenser containment installed prior to that date.

4. Require persons who conduct UST monitoring equipment annual maintenance certification to have a California contractors license, and be certified, and triennially re-certified, by the manufacturer of the monitoring equipment being tested;

5. Require UST installers to be triennially re-certified by the manufacturer of the tank system being installed

The attached package is being submitted to you for your review and approval, and includes:

- The proposed amended regulations in underline and strikeout format
- A revised Notice of Proposed Rulemaking
- A revised Initial Statement of Reasons
- The Notice Publication/Regulations Submission (Form 400)
- A revised Economic and Fiscal Impact Statement (Form 399) for your signature
- A Memo for your signature to Winston Hickox, Agency Secretary, transmitting the proposed amendments
- A Memo for your signature to John D. Smith, Office of Administrative Law, transmitting Form 400 (Notice Publication/Regulations Submission) and the Notice of Proposed Rulemaking for publication in the California Regulatory Notice Register.
- A Memo for your signature to Kathy Chovan, Department of Finance transmitting the revised Fiscal Impact Statement (Form 399), the Fiscal Impact Summary, and a copy of the proposed regulations.

Senate Bill 989 has set various deadlines for State Water Resources Control Board (SWRCB) adoption of individual components of the proposed regulations, with the first deadline set at January 1, 2001. However, the first deadline for tank owners or operators is November 1, 2000 for implementation of enhanced leak detection. Tank owners or operators subject to the enhanced leak detection requirements must first be notified by the SWRCB through its

Geographic Information System (GIS) database, which is currently being prepared for this activity. Therefore, early adoption of the proposed regulations is needed to allow adequate time for the SWRCB to provide this notification.

Upon your approval and signatures on the appropriate documents, please return the completed package to Charles NeSmith, underground storage tank engineering unit, who will then forward the package to the Secretary for Environmental Protection, California Environmental Protection Agency, and the Department of Finance.

Attachments

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// State Water Resources Control Board
Jim Stubchaer, Chairman

Executive Office
901 P Street • Sacramento, California 95814 • (916) 657-0941 FAX (916)657-0932
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

TO: Winston H. Hickox
Agency Secretary
California Environmental Protection Agency
555 Capitol Mall, Suite 525
Sacramento, CA 95814

FROM: Walt Pettit
Executive Director
EXECUTIVE OFFICE

DATE:

SUBJECT: AMENDMENTS TO TITLE 23, CHAPTER 16, CALIFORNIA CODE OF REGULATIONS (CCR) – UNDERGROUND STORAGE TANK (UST) REGULATIONS

The State Water Resources Control Board (SWRCB) is proposing to amend Chapter 16, Division 3, Title 23 of the California Code of Regulations (commencing with Section 25280), relating to construction and monitoring of underground storage tanks.

Amendments to the UST regulations are being proposed to interpret, clarify, and implement legislative changes made to Chapter 6.75 of the Health and Safety Code pursuant to Chapter 812, Statutes of 1999 (Sher) (Senate Bill 989). These amendments to Title 23 will:

1. Require UST owners or operators to conduct triennial testing of UST secondary containment systems, including testing of under-dispenser containment;

2. Require UST owners or operators of UST systems, which have a single-walled component and are located within 1000 feet of a public drinking water well, to conduct triennial enhanced leak detection. This enhanced leak detection must be a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

3. Require all UST owners and operators, including those who own or operate single-walled UST systems, to install under-dispenser containment by December 31, 2003. Some UST systems must have the under-dispenser containment installed prior to that date.

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4. Require persons who conduct UST monitoring equipment annual maintenance certification to have a California contractors license, and be certified, and triennially re-certified, by the manufacturer of the monitoring equipment being tested;

5. Require UST installers to be triennially re-certified by the manufacturer of the tank system being installed

The attached package is being submitted to you for your review and approval, and includes:

- The proposed amended regulations in underline and strikeout format
- The Notice of Proposed Rulemaking
- The Initial Statement of Reasons
- The Notice Publication/Regulations Submission (Form 400)
- The Economic and Fiscal Impact Statement (Form 399) for your signature

Senate Bill 989 has set various deadlines for State Water Resources Control Board (SWRCB) adoption of individual components of the proposed regulations, with the first deadline set for January 1, 2001. However, the first deadline for tank owners or operators is November 1, 2000 for implementation of enhanced leak detection. Tank owners or operators subject to the enhanced leak detection requirements must first be notified by the SWRCB through its Geographic Information System (GIS) database, which is currently being prepared for this activity. Therefore, early adoption of the proposed regulations is needed to allow adequate time for the SWRCB to provide this notification.

Upon your approval and signatures on the appropriate documents, please return the completed package to Charles NeSmith, Associate Engineering Geologist for the Underground Storage Tank Engineering Unit, SWRCB, Division of Clean Water Programs, 2014 "T" Street, Sacramento, CA 95814. Should you have any questions on the proposed amendments, please contact me at (916) 657-0941.

Attachments

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State Water Resources Control Board

Jim Stubchaer, Chairman

Executive Office

901 P Street • Sacramento, California 95814 • (916) 227-4377 FAX (916))227-4349
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

TO: John D. Smith, Director
Office of Administrative Law
555 Capitol Mall, Suite 1290
Sacramento, CA 95814-4602

FROM: Walt Pettit
Executive Director
EXECUTIVE OFFICE

DATE:

SUBJECT: PROPOSED AMENDMENTS TO CHAPTER 16, UNDERGROUND STORAGE TANK REGULATIONS

The State Water Resources Control Board (SWRCB) is proposing to amend its underground storage tank regulations and is therefore submitting a Notice of Proposed Rulemaking for publication in the California Regulatory Notice Register.

As required, we are submitting the following documents:

- Notice Publication/Regulations Submission (Form 400) - 2 copies
- Notice of Proposed Rulemaking - 4 copies (also on Diskette)
- Proposed Amendments to the Underground Storage Tank Regulations - 1 copy
- Initial Statement of Reasons - 1 copy
- Regulations Mailing List

The notice will be mailed to all persons who have filed a request with the SWRCB to receive notice of regulatory actions, local government agencies, and Regional Water Quality Control Boards. Upon your approval, please return the approved Form 400 to Charles NeSmith, SWRCB, 2014 "T" Street, Sacramento, CA 95814.

If you have any questions please contact Charles NeSmith at (916) 227-4377.

Attachments

State Water Resources Control Board

Jim Stubchaer, Chairman

Winston H. Hickox
Secretary for Environmental Protection

Executive Office
901 P Street • Sacramento, California 95814 • (916) 227-4377 FAX (916) 227-4349
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100

Gray Davis
Governor

TO: Kathy Chovan, Finance Budget Analyst
Department of Finance
915 L Street
Sacramento, CA 95814

FROM: Walt Pettit
Executive Director
EXECUTIVE OFFICE

DATE:

SUBJECT: PROPOSED AMENDMENTS TO CHAPTER 16, UNDERGROUND STORAGE TANK REGULATIONS

Attached for your review and concurrence are: 1) A revised Fiscal Impact Statement (Form 399) for the proposed amendments to Chapter 16 (underground storage tank regulations); 2) A revised Fiscal Impact Summary; and 3) a revised copy of the proposed amended regulations. These documents are being resubmitted to the Department of Finance (DOF) after significant revisions were made to the original Fiscal Impact documents (submitted to DOF on February 9, 2000) in response to comments and questions from Monica Allen of your office, and from the State Water Resources Control Board (SWRCB) Budget Office and Economics Unit. The revised Fiscal Impact Statement has been reviewed and endorsed by our Budget Office.

Amendments to the underground storage tank regulations are being proposed to interpret, clarify, and implement legislative changes made to chapter 6.75 of the Health and Safety Code pursuant to chapter 812, statutes of 1999 (Sher) (Senate Bill 989). A public hearing will be scheduled no sooner than 45 days after publication of these regulations in the California Regulatory Notice Register.

Should you have any questions regarding this request or the Fiscal Impact Statement, please contact Charles NeSmith, Associate Engineering Geologist, Underground Storage Tank Engineering Unit, at (916) 227-4377. Upon your concurrence and signature on the Form 399, please return the completed package to Charles NeSmith, State Water Resources Control Board, Division of Clean Water Programs, 2014 "T" Street, Sacramento, CA 95814.

Attachments

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State Water Resources Control Board

Jim Stubchaer, Chairman

Executive Office
901 P Street • Sacramento, California 95814 • (916) 227-4377 FAX (916))227-4349
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

TO: John D. Smith, Director
Office of Administrative Law
555 Capitol Mall, Suite 1290
Sacramento, CA 95814-4602

FROM: Walt Pettit
Executive Director
EXECUTIVE OFFICE

DATE:

SUBJECT: PROPOSED AMENDMENTS TO CHAPTER 16, UNDERGROUND STORAGE TANK REGULATIONS

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If you have any questions please contact Charles NeSmith at (916) 227-4377.

Attachments

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State Water Resources Control Board

Jim Stubchaer, Chairman

Executive Office
901 P Street • Sacramento, California 95814 • (916) 227-4377 FAX (916))227-4349
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

TO: John D. Smith, Director
Office of Administrative Law
555 Capitol Mall, Suite 1290
Sacramento, CA 95814-4602

Walt Pettit

FROM: Walt Pettit
Executive Director
EXECUTIVE OFFICE

DATE: MAR 31 2000

SUBJECT: PROPOSED AMENDMENTS TO CHAPTER 16, UNDERGROUND STORAGE TANK REGULATIONS

The State Water Resources Control Board (SWRCB) is proposing to amend its underground storage tank regulations and is therefore submitting a Notice of Proposed Rulemaking for publication in the California Regulatory Notice Register.

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- Initial Statement of Reasons - 1 copy
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The notice will be mailed to all persons who have filed a request with the SWRCB to receive notice of regulatory actions, local government agencies, and Regional Water Quality Control Boards. Upon your approval, please return the approved Form 400 to Charles NeSmith, SWRCB, 2014 "T" Street, Sacramento, CA 95814.

If you have any questions please contact Charles NeSmith at (916) 227-4377.

Attachments

II. FORM 400 (including justification for early effective date)

STATE OF CALIFORNIA--OFFICE OF ADMINISTRATIVE LAW

NOTICE PUBLICATION/REGULATIONS SUBMISSION

(See instructions on reverse)

REGULAR

STD. 400 (REV. 4-99)

For use by Secretary of State only

OAL FILE NUMBERS	NOTICE FILE NUMBER	REGULATORY ACTION NUMBER	EMERGENCY NUMBER
	Z-00-5202-05	01-0402-01S	

For use by Office of Administrative Law (OAL) only

2001 APR -2 AM 10: 02

OFFICE OF ADMINISTRATIVE LAW

NOTICE | REGULATIONS

AGENCY WITH RULEMAKING AUTHORITY
STATE WATER RESOURCES CONTROL BOARD

AGENCY FILE NUMBER (If any)

A. PUBLICATION OF NOTICE *(Complete for publication in Notice Register)*

1. SUBJECT OF NOTICE	TITLE(S)	FIRST SECTION AFFECTED	2. REQUESTED PUBLICATION DATE

3. NOTICE TYPE	4. AGENCY CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER (Optional)
☐ Notice re Proposed Regulatory Action ☐ Other		( )	( )

OAL USE ONLY	ACTION ON PROPOSED NOTICE	NOTICE REGISTER NUMBER	PUBLICATION DATE
	☐ Approved as Submitted ☐ Approved as Modified ☐ Disapproved/ Withdrawn		

B. SUBMISSION OF REGULATIONS *(Complete when submitting regulations)*

1a. SUBJECT OF REGULATION(S)	1b. ALL PREVIOUS RELATED OAL REGULATORY ACTION NUMBER(S)
UNDERGROUND STORAGE TANKS	

2. SPECIFY CALIFORNIA CODE OF REGULATIONS TITLE(S) AND SECTION(S) *(Including title 26, if toxics-related)*

SECTION(S) AFFECTED *(List all section number(s) individually)*

ADOPT
2636.1, 2636.2, 2636.3, 2636.4, 2637, AND 2644.1

AMEND
2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, AND 2666

TITLE(S)
23

REPEAL

3. TYPE OF FILING

☑ Regular Rulemaking (Gov. Code, § 11346)

☐ Resubmittal of disapproved or withdrawn nonemergency filing (Gov. Code, §§ 11349.3, 11349.4)

☐ Emergency (Gov. Code, § 11346.1(b))

☐ Emergency Readopt (Gov. Code, § 11346.1(h))

☐ Resubmittal of disapproved or withdrawn emergency filing (Gov. Code, § 11346.1)

☐ Certificate of Compliance: The agency officer named below certifies that this agency complied with the provisions of Government Code §§ 11346.2 - 11346.9 prior to, or within 120 days of, the effective date of the regulations listed above.

☐ Print Only

☐ Changes Without Regulatory Effect (Cal. Code Regs., title 1, § 100)

☐ Other (specify)

4. ALL BEGINNING AND ENDING DATES OF AVAILABILITY OF MODIFIED REGULATIONS AND/OR MATERIAL ADDED TO THE RULEMAKING FILE *(Cal. Code Regs. title 1, §§ 44 and 45)*
NOV. 22 TO DEC. 11, 2000; DEC. 22, 2000 TO JAN 8, 2001; JAN 9 TO JAN 26, 2001

5. EFFECTIVE DATE OF REGULATORY CHANGES *(Gov. Code, §§ 11343.4, 11346.1(d))*

☐ Effective 30th day after filing with Secretary of State ☑ Effective on filing with Secretary of State ☐ Effective other *(Specify)*

6. CHECK IF THESE REGULATIONS REQUIRE NOTICE TO, OR REVIEW, CONSULTATION, APPROVAL OR CONCURRENCE BY, ANOTHER AGENCY OR ENTITY

☑ Department of Finance (Form STD. 399) (SAM §6660) ☐ Fair Political Practices Commission ☐ State Fire Marshal

☐ Other (Specify)

7. CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER (Optional)	E-MAIL ADDRESS (Optional)
CHARLES NESMITH	(916) 341-5855	(916) 351-5808	nesmithc@cwp.swrcb.ca.gov

8.

I certify that the attached copy of the regulation(s) is a true and correct copy of the regulation(s) identified on this form, that the information specified on this form is true and correct, and that I am the head of the agency taking this action, or a designee of the head of the agency, and am authorized to make this certification.

SIGNATURE OF AGENCY HEAD OR DESIGNEE

Edward C. Anton

DATE
3/30/01

TYPED NAME AND TITLE OF SIGNATORY
...nton, Executive Director

1

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

March 15, 2001

FINAL PROPOSED TEXT OF REGULATIONS

Amend Title 23, Division 3, Chapter 16, Article 1, section 2611 of the California Code of Regulations to read as follows:

2611. Additional Definitions

Unless the context requires otherwise, the following definitions shall apply to terms used in this chapter.

"Bladder system" means a flexible or rigid material which provides primary containment including an interstitial monitoring system designed to be installed inside an existing underground storage tank.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. The term includes only persons who have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"Coatings expert" means a person who, by reason of thorough training, knowledge, and experience in the coating of metal surfaces, is qualified to engage in the practice of internal tank lining inspections. The term includes only those persons who are independent of any lining manufacturer or applicator and have no financial interest in the tank or tanks being monitored.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which hazardous substances flow. For the purpose of determining how much piping is connected to any individual underground storage tank system, the piping that joins two underground storage tank systems should be allocated equally between them.

"Continuous monitoring" means a system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

"Dispenser" means an aboveground or underground device that is used for the delivery of a hazardous substance from an underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

"Heating oil tank" means a tank located on a farm or at a personal residence and which holds no more than 1,100 gallons of home heating oil which is used consumptively at the premises where the tank is located.

"Holiday," when used with respect to underground storage tank coating or cladding, means a pinhole or void in a protective coating or cladding.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Inconclusive" means the conclusion of a statistical inventory reconciliation report that is not decisive as to whether a release has been detected.

"Independent testing organization" means an organization which tests products or systems for compliance with voluntary consensus standards. To be acceptable as an independent testing organization, the organization shall not be owned or controlled by any client, industrial organization, or any other person or institution with a financial interest in the product or system being tested. For an organization to certify, list, or label products or systems in compliance with voluntary consensus standards, it shall maintain formal periodic inspections of production of products or systems to ensure that a listed, certified, or labeled product or system continues to meet the appropriate standards.

"Independent third party" means independent testing organizations, consulting firms, test laboratories, not-for-profit research organizations and educational institutions with no financial interest in the matters under consideration. The term includes only those organizations which are not owned or controlled by any client, industrial organization, or any other institution with a financial interest in the matter under consideration.

"Integral secondary containment" means a secondary containment system manufactured as part of the underground storage tank.

"Interstitial space" means the space between the primary and secondary containment systems.

"Leak threshold" means the value against which test measurements are compared and which serves as the basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate.

"Liquid asphalt tank" means an underground storage tank which contains steam-refined asphalts.

"Liquefied petroleum gas tank" means an underground storage tank which contains normal butane, isobutane, propane, or butylene (including isomers) or mixtures composed predominantly thereof in a liquid or gaseous state having a vapor pressure in excess of 40 pounds per square inch absolute at a temperature of 100 degrees Fahrenheit.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing hazardous substances.

"Manufacturer" means any business which produces any item discussed in these regulations.

"Manual inventory reconciliation" means a procedure for determining whether an underground tank system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. This term does not include procedures which are based on statistical inventory reconciliation.

"Membrane liner" means any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored.

"Membrane liner fabricator" means any company which converts a membrane liner into a system for secondary containment.

"Membrane manufacturer" means any company which processes the constituent polymers into membrane sheeting from which the membrane liner is fabricated into a system for secondary containment.

"Motor vehicle" means a self-propelled device by which any person or property may be propelled, moved, or drawn.

"Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil.

"New underground storage tank" means an underground storage tank which is not an existing underground storage tank.

"Non-volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and consideration of circumstances and physical phenomena internal or external to the tank.

"Operational life" means the period beginning when installation of the tank system has begun until the time the tank system should be properly closed.

"Operator" means any person in control of, or having responsibility for, the daily operation of an underground storage tank system.

"Person", as defined in Chapter 6.7 of Division 20 of the Health and Safety Code includes any entity defined as a person under the Federal Act.

"Perennial ground water" means ground water that is present throughout the year.

"Petroleum" means petroleum including crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.

"Pipeline leak detector" means a continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less.

"Probability of detection" means the likelihood, expressed as a percentage, that a test method will correctly identify a leaking underground storage tank.

"Probability of false alarm" means the likelihood, expressed as a percentage, that a test method will incorrectly identify a "tight" tank as a leaking underground storage tank.

"Qualitative release detection method" means a method which detects the presence of a hazardous substance or suitable tracer outside the underground storage tank being tested.

"Quantitative release detection method" means a method which determines the integrity of an underground storage tank by measuring a release rate or by determining if a release exceeds a specific rate.

"Release detection method or system" means a method or system used to determine whether a release of a hazardous substance has occurred from an underground tank system into the environment or into the interstitial space between an underground tank system and its secondary containment.

"Repair" means to restore a tank or underground storage tank system component that has caused a release of a hazardous substance from the underground storage tank system.

"Septic tank" means a tank designed and used to receive and process biological waste and sewage.

"Statistical inventory reconciliation" means a procedure to determine whether a tank is leaking based on the statistical analysis of measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically.

"Statistical inventory reconciliation provider" means the developer of a statistical inventory reconciliation method that meets federal and state standards as evidenced by a third-party evaluation conducted according to section 2643(f), or an entity that has been trained and certified by the developer of the method to be used. In either case, the provider shall have no direct or indirect financial interest in the underground storage tank being monitored.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Substantially beneath the surface of the ground" means that at least 10 percent of the underground tank system volume, including the volume of any connected piping, is below the ground surface or enclosed below earthen materials.

"Sump," "pit," "pond," or "lagoon" means a depression in the ground which lacks independent structural integrity and depends on surrounding earthen material for structural support of fluid containment.

"Tank integrity test" means a test method that can ascertain the physical integrity of an underground storage tank. The term includes only test methods which are able to detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of 5 percent or less. The test method may be either volumetric or non-volumetric in nature. A leak rate is reported using a volumetric test method, whereas, a non-volumetric test method reports whether a substance or physical phenomenon is detected which may indicate the presence of a leak.

"Unauthorized release" as defined in Chapter 6.7 of Division 20 of the Health and Safety Code does not include intentional withdrawals of hazardous substances for the purpose of legitimate sale, use, or disposal.

"Under-Dispenser Containment" means secondary containment that is located under a dispenser.

"Under-Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of hazardous substances.

"Upgrade compliance certificate" includes a numbered decal, file copy of the decal, and plastic fill pipe tag as described in Section 2712.1 of these regulations.

"Volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and comparison of tank volume.

"Voluntary consensus standards" means standards that shall be developed after all persons with a direct and material interest have had a right to express a viewpoint and, if dissatisfied, to appeal at any point (a partial list of the organizations that adopt voluntary consensus standards are shown in Appendix I, Table B).

"Wastewater treatment tank" means a tank designed to treat influent wastewater through physical, chemical, or biological methods and which is located inside a public or private wastewater treatment facility. The term includes untreated wastewater holding tanks, oil water separators, clarifiers, sludge holding tanks, filtration tanks, and clarified water tanks that do not continuously contain hazardous substances.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25282, 25283, 25284, 25284.1, 25292.3 and 25299.5(a), Health and Safety Code; 40 CFR 280.10 and 280.12.

Amend Title 23, Division 3, Chapter 16, Article 3, existing sections 2630, 2631, 2635, and 2636 of the California Code of Regulations to read as follows:

2630. General Applicability of Article

(a) The requirements in this article apply to owners of new underground storage tanks. ~~Underground storage tanks installed after January 1, 1984, may be deemed to be in compliance with the requirements in this article if they were installed in accordance with federal and state requirements that existed at the time of installation. However~~ In addition, the applicable repair and upgrade requirements in Article 6 shall be complied with.

(b) Sections 2631 and 2632 specify design, construction, and monitoring requirements for all new underground storage tanks. Sections 2633 and 2634 specify alternate design, construction, and monitoring requirements, in lieu of those specified in sections 2631 and 2632, for underground storage tanks installed before January 1, 1997 which store only motor vehicle fuel. ~~New~~ Uunderground storage tanks ~~which store only motor vehicle fuels may be~~ constructed ~~and monitored~~ pursuant to the requirements specified in sections 2633 ~~and 2634~~ in lieu of those specified in sections 2631 ~~and 2632. However, if the tank is constructed according to requirements in section 2633 the monitoring requirements of section 2634 shall also be met.~~ shall be monitored in accordance with section 2634.

(c) All new underground storage tanks, piping, and secondary containment systems shall comply with sections 2635 and 2636.

(d) All monitoring equipment used to satisfy the requirements of this article ~~sections 2632, 2634, and 2636~~ shall meet the requirements of section 2643(f) and shall be installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity. Additionally, all monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated, and maintained in accordance with section 2637(b). ~~manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.~~

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292.3, Health and Safety Code; 40 CFR 280.20.

2631. Design and Construction Requirements for New Underground Storage Tanks

(a) All new underground storage tanks including associated piping used for the storage of hazardous substances shall have primary and secondary of containment. Primary containment shall be product-tight. Secondary containment may be manufactured as an integral part of the primary containment or it may be constructed as a separate containment system. Secondary containment systems shall be designed and constructed such that the secondary containment system can be periodically tested in accordance with section 2637(a).

(b) The design and construction of all primary containment including any integral secondary containment system, shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. All other components used to construct the primary containment system, such as special accessories, fittings, coatings or linings, monitoring systems and level controls used to form the underground storage tank system shall also be approved by an independent testing organization. This requirement became effective on July 1, 1991 for underground storage tanks; January 1, 1992 for piping; and shall be effective on January 1, 1995 for all other components. The exterior surface of underground storage tanks shall bear a marking, code stamp, or label showing the following minimum information:

(1) Engineering standard used;
(2) Nominal diameter in feet;
(3) Nominal capacity in gallons;
(4) Degree of secondary containment;
(5) Useable capacity in gallons;
(6) Design pressure in psig;
(7) Maximum operating temperature in degrees Fahrenheit;
(8) Construction materials;
(9) Year manufactured; and
(10) Identity of manufacturer.

(c) A primary containment system with or without an integral secondary containment system shall have wear plates (striker plates) installed, center to center, below all accessible openings. The plates shall be made of steel or other appropriate material if steel is not compatible with the hazardous substance stored. The width of the plate shall be at least eight inches on each side, or shall be equal to the area of the accessible opening or guide tube, whichever is larger. The thickness of the steel plate shall be at least 1/8 inch and those made of other materials shall be of sufficient thickness to provide equivalent protection. The plate, if under 1/4 inch thick, shall be rolled to the contours of the underground storage tank and all plates shall be bonded or tack welded in place. A drop tube-mounted bottom protector may fulfill this requirement.

(d) A secondary containment system which is not an integral part of primary containment shall be designed and constructed according to an engineering specification approved by a state registered professional engineer or according to a nationally recognized industry code or engineering standard. The engineering specification shall include the construction procedures. Materials used to construct the secondary containment system shall have sufficient thickness, density, and corrosion resistance to prevent structural weakening or damage to the secondary containment system as a result of contact with any released hazardous substance. The following requirements apply to these secondary containment systems:

(1) The secondary containment system shall be constructed to contain at least the following volumes:

(A) One hundred percent of the usable capacity of the primary containment system where only one primary container is within the secondary containment system.

(B) In the case of multiple primary containers within a single secondary containment system, the secondary containment system shall be large enough to contain 150 percent of the volume of the largest primary container within it, or 10 percent of the aggregate internal volume of all primary containers within the secondary containment system, whichever is greater. When all primary containers are completely enclosed within the secondary containment system, the restrictions of this subsection do not apply.

(2) If the secondary containment system is open to rainfall, it shall be constructed to accommodate the volume of precipitation which could enter the secondary containment system during a 24-hour, 25-year storm in addition to the volume specified in subsection (d)(1).

(3) If backfill material is placed in the secondary containment system, the volumetric requirements for the pore space shall be equal to the requirement in subsection (d)(1). The available pore space in the secondary containment system backfill shall be determined using standard engineering methods and safety factors. The specific retention and specific yield of the backfill material, the location of any primary container within the secondary containment, and the proposed method of operation for the secondary containment system shall be considered in determining the available pore space.

(4) The secondary containment system shall be equipped with a collection system to accumulate, temporarily store, and permit removal of any liquid within the system.

(5) The floor of the secondary containment system shall be constructed on a firm base and, if necessary for monitoring, shall be sloped to a collection sump. One or more access casings shall be installed in the sump and sized to allow removal of collected liquid. The access casing shall extend to the ground surface, be perforated in the region of the sump, and be covered with a locked waterproof cap or enclosed in a surface security structure that will protect the access casing(s) from entry of surface water, accidental damage, unauthorized access, and vandalism. A facility with locked gates will satisfy the requirements for protection against unauthorized access and vandalism. The casing shall have sufficient thickness to withstand all anticipated stresses with appropriate engineering safety factors and constructed of materials that will not be structurally weakened by the stored hazardous substance and will not donate, capture, or mask constituents for which analyses will be made.

(6) Secondary containment systems utilizing using membrane liners shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. A membrane liner shall contain no primary nutrients or food-like substances attractive to rodents and shall meet the requirements in Table 3.1 after a 30-day immersion in the stored hazardous substance.

(7) A membrane liner, if used, shall be installed under the direct supervision of a representative of the membrane liner fabricator or a contractor certified by the fabricator.

(8) The excavation base and walls for a membrane liner shall be prepared to the membrane liner fabricator's specifications and shall be firm, smooth, and free of any sharp objects or protrusions.

(9) The site shall be assessed to ensure that the secondary containment is always above the ground water and not in a 25-year flood plain, unless the containment and monitoring designs are for use under such conditions.

(e) Laminated, coated, or clad materials shall be considered a single wall and do not fulfill the requirements of both primary and secondary containment.

(f) Underground storage tanks with integral secondary containment systems, which satisfy the construction requirements of subsection (b), fulfill the volumetric requirements for secondary containment specified in subsection (d)(1).

(g) Underground storage tanks with secondary containment systems shall be designed and installed so that any loss of a hazardous substance from the primary containment will be detected by an interstitial monitoring device or method.

(h) An underground storage tank which contains motor vehicle fuel and which is designed with an integral secondary containment system shall provide 100 percent secondary containment unless it is equipped with the overfill prevention system in accordance with section 2635(b)(2)(C). In this case, the top portion of the tank, no greater than two feet wide along the length of the tank, may be single-walled.

(i) Tanks designed and constructed pursuant to the provisions of this section shall be monitored according to the provisions of section 2632.

Authority cited: Sections 25299.3 and 25299.7 Health and Safety Code.
Reference: Sections 25281, 25284.1 and 25291, Health and Safety Code; 40 CFR 280.20.

2635. Installation and Testing Requirements for All New Underground Storage Tanks

(a) Primary and secondary containment systems shall be designed, constructed, tested, and certified to comply, as applicable, with all of the following requirements:

(1) All underground storage tanks shall be tested at the factory before being transported. The tests shall determine whether the tanks were constructed in accordance with the applicable sections of the industry code or engineering standard under which they were built.

(2) The outer surface of underground storage tanks constructed of steel shall be protected from corrosion as follows, except that primary containment systems installed in a secondary containment system and not backfilled do not need cathodic protection:

(A) Field-installed cathodic protection systems shall be designed and certified as adequate by a corrosion specialist. The cathodic protection systems shall be tested by a cathodic protection tester within six months of installation and at least every three years thereafter. The criteria that are used to determine that cathodic protection is adequate as required by this section shall be in accordance with a code of practice developed in accordance with voluntary consensus standards. Impressed-current cathodic protection systems shall also be inspected no less than every 60 calendar days to ensure that they are in proper working order.

(B) Underground storage tanks protected with fiberglass-reinforced plastic coatings, composites, or equivalent non-metallic exterior coatings or coverings, including coating/sacrificial anode systems, shall be tested at the installation site using an electric resistance holiday detector. All holidays detected shall be repaired and checked by a factory authorized repair service before installation. During and after installation, care shall be taken to prevent damage to the protective coating or cladding. Preengineered corrosion protection systems with sacrificial anodes shall be checked once every three years in accordance with the manufacturer's instructions.

(3) Before installation, the tank shall be tested for tightness at the installation site in accordance with the manufacturer's written guidelines. If there are no guidelines, the primary and secondary containment shall be tested for tightness with air pressure at not less than 3 pounds per square-inch (20.68 k Pa) and not more than 5 pounds per square-inch (34.48 k Pa). In lieu of the above, an equivalent differential pressure test, expressed in inches of mercury vacuum, in the interstitial space of the secondary containment, is acceptable. The pressure (or vacuum in the interstitial space) shall be maintained for a minimum of 30 minutes to determine if the tank is tight. If a tank fails the tightness test, as evidenced by soap bubbles, or water droplets, installation shall be suspended until the tank is replaced or repaired by a factory authorized repair service. Following repair or replacement, the tank shall pass a tightness test.

(4) All secondary containment systems shall pass a post-installation test which meets the approval of the local agency.

(5) After installation, but before the underground storage tank is placed in service, a tank integrity test shall be conducted to ensure that no damage occurred during installation. The tank integrity test is not required if the tank is equipped with an interstitial monitor certified by a third-party evaluator to meet the performance standards of a "tank integrity test" as defined in section 2611, or if the tank is tested using another method deemed by the State Water Resources Control Board to be equivalent.

(6) All underground storage tanks shall be installed according to a code of practice developed in accordance with voluntary consensus standards and the manufacturer's written installation instructions. The owner or operator shall certify that the underground storage tank was installed in accordance with the above requirements as required by subsection (d) of this section.

(7) All underground storage tanks subject to flotation shall be anchored using methods specified by the manufacturer or, if none exist, shall be anchored according to the best engineering judgment.

(b) All underground storage tanks shall be equipped with a spill container and an overfill prevention system as follows:

(1) The spill container shall collect any hazardous substances spilled during product delivery operations to prevent the hazardous substance from entering the subsurface environment. The spill container shall meet the following requirements:

(A) If it is made of metal, the exterior wall shall be protected from galvanic corrosion.
(B) It shall have a minimum capacity of five gallons (19 liters).
(C) It shall have a drain valve which allows drainage of the collected spill into the primary container or provide a means to keep the spill container empty.

(2) The overfill prevention system shall not allow for manual override and shall meet one of the following requirements:

(A) Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or

(B) Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm sounds at least five minutes before the tank overfills; or

(C) Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or,
(D) Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

(3) The local agency may waive the requirement for overfill prevention equipment where the tank inlet exists in an observable area, the spill container is adequate to collect any overfill, and the tank system is filled by transfers of no more than 25 gallons at one time.

(c) Secondary containment systems including leak interception and detection systems installed pursuant to section 2633 shall comply with all of the following:

(1) The secondary containment system shall encompass the area within the system of vertical planes surrounding the exterior of the primary containment system. If backfill is placed between the primary and secondary containment systems, an evaluation shall be made of the maximum lateral spread of a point leak from the primary containment system over the vertical distance between the primary and secondary containment systems. The secondary containment system shall extend an additional distance beyond the vertical planes described above equal to the radius of the lateral spread plus one foot.

(2) The secondary containment system shall be capable of preventing the inflow of the highest ground water anticipated into the interstitial space during the life of the tank.

(3) If the interstitial space is backfilled, the backfill material shall not prevent the vertical movement of leakage from any part of the primary containment system.

(4) The secondary containment system with backfill material shall be designed and constructed to promote gravity drainage of an unauthorized release of hazardous substances from any part of the primary containment system to the monitoring location(s).

(5) Two or more primary containment systems shall not use the same secondary containment system if the primary containment systems store materials that in combination may cause a fire or explosion, or the production of a flammable, toxic, or poisonous gas, or the deterioration of any part of the primary or secondary containment system.

(6) Drainage of liquid from within a secondary containment system shall be controlled in a manner approved by the local agency to prevent hazardous materials from being discharged into the environment. The liquid shall be analyzed to determine the presence of any of the hazardous substance(s) stored in the primary containment system prior to initial removal, and monthly thereafter, for any continuous discharge (removal) to determine the appropriate method for final disposal. The liquid shall be sampled and analyzed immediately upon any indication of an unauthorized release from the primary containment system.

(7) For primary containment systems installed completely beneath the ground surface, the original excavation for the secondary containment system shall have a water-tight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as water-tight as practical.

Primary containment systems with integral secondary containment and open vaults are exempt from the requirements of this subsection.

(8) The actual location and orientation of the tanks and appurtenant piping systems shall be indicated on as-built drawings of the facility. Copies of all drawings, photographs, and plans shall be submitted to the local agency for approval.

(d) Owners or their agents shall certify that the installation of the tanks and piping meets the conditions in subdivisions (1) through (5) below. The certification shall be made on a "Certificate of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(1) The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers. <u>On and after July 1, 2001, this certification shall be renewed by completion of the manufacturer's refresher training at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.</u>

(2) The installer has been certified or licensed by the Contractors State License Board;

(3) The underground storage tank, any primary piping, and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions;

(4) All work listed in the manufacturer's installation checklist has been completed; and

(5) The installation has been inspected and approved by the local agency, or, if required by the local agency, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, <u>25284.1, 25291</u> and 25299, Health and Safety Code; 40 CFR 280.40 - 280.45.

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping.

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems shall be sloped so that all releases will flow to a collection sump located at the low point of the underground piping.

(2) Primary piping and secondary containment systems shall be installed in accordance with an industry code of practice developed in accordance with voluntary consensus standards. The owner or operator shall certify that the piping was installed in accordance with the above requirements of section 2635(d). The certification shall be made on the "Certification of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(d) Lined trench systems used as part of a secondary containment system shall be designed and constructed according to a code of practice or engineering standard approved by a state registered professional engineer. The following requirements shall also apply:

(1) All trench materials shall be compatible with the substance stored and evaluated by an independent testing organization for their compatibility or adequacy of the trench design, construction, and application.

(2) The trench shall be covered and capable of supporting any expected vehicular traffic.

(e) All new primary piping and secondary containment systems shall be tested for tightness after installation in accordance with manufacturer's guidelines. Primary pressurized piping shall be tested for tightness hydrostatically at 150 percent of design operating pressure or pneumatically at 110 percent of design operating pressure. If the calculated test pressure for pressurized piping is less than 40 psi, 40 psi shall be used as the test pressure. The pressure shall be maintained for a minimum of 30 minutes and all joints shall be soap tested. A failed test, as evidenced by the presence of bubbles, shall require appropriate repairs and retesting. If there are no manufacturer's guidelines, secondary containment systems shall be tested using an applicable method specified in an industry code or engineering standard. Suction piping and gravity flow piping which cannot be isolated from the tank shall be tested after installation in conjunction with an overfilled volumetric tank integrity test, or other test method meeting the requirements of section 2643(f), if approved by the local agency.

(f) Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems as follows:

(1) All ~~The~~ secondary containment, including under-dispenser containment, and under-dispenser spill control or containment systems ~~, system~~ shall be equipped with a continuous monitoring system that either activates ~~which meets the requirements of section 2643(f) and which is connected to~~ an audible and visual alarm ~~system~~ or stops the flow of product at the dispenser when it detects a leak.

(2) Automatic line leak detectors shall be installed on underground pressurized piping and shall be capable of detecting a 3-gallon per hour leak rate at 10 psi within 1 hour with a probability of detection of at least 95 percent and a probability of false alarm no greater than 5 percent. ~~Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.~~

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section~~. A~~ Ccontinuous monitoring systems as described in subdivision (1), which shuts down the pump in addition to either activating the audible and visual alarm

~~system~~ or stopping the flow of product at the dispenser, satisfy~~ies~~ the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure of the product piping system at the test pressure with at least a 95 percent probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) All ~~The~~ secondary containment systems ~~is~~ are equipped with ~~a~~ continuous monitoring systems. The leak detection device may be located at the pump sump for sections of ~~if~~ *the piping* that *slope~~s~~ back to this point.*

(2) All ~~A~~ continuous monitoring systems ~~is~~ for the piping are connected to ~~an audible and visual alarm system and~~ the pumping system.

(3) All ~~A~~ continuous monitoring systems for the piping shut~~s~~ down the pump and either activate~~s~~ an audible and visual ~~the~~ alarm ~~system~~ or stop the flow of product at the dispenser when they detect a leak ~~a release is detected~~.

(4) The pumping system shuts down automatically if any of the continuous monitoring systems for the piping fail or are ~~is~~ disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:

(1) Owners or Operators of a UST system shall have the system fitted with under-dispenser containment, or an approved under-dispenser spill containment or control system according to the following schedule:

(A) At the time of installation for systems installed after January 1, 2000.

(B) By July 1, 2001, for systems installed after July 1, 1987 that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state Geographic Information System mapping database.

(C) By December 31, 2003, for systems not subject to subsection 2636(h)(1)(A) or (B).

(2) Under-dispenser containment shall be designed, constructed, installed, and monitored in accordance with section 2631, 2636(c)(2), 2636(e), and 2636(f).

(3) A manufacturer of an under-dispenser spill containment or control system may apply to the Division of Clean Water Programs Underground Storage Tank Program Manager for approval of the system. Owners or operators shall not install an under-dispenser spill containment or control system that has not been approved.

(A) Applications for approval shall be submitted in writing and include the following:

(i) A description of the proposed system.

(ii) Clear and convincing evidence that the system will protect the soil and beneficial uses of the waters of the state from unauthorized releases.

(B) The Program Manager shall review the application to determine if the proposed system adequately protects the soil and beneficial uses of groundwater before determining whether to approve the proposed system.

(C) The Program Manager may modify or revoke a previously issued approval if it finds that, based on new evidence, the approved system does not adequately protect the soil and beneficial uses of groundwater from unauthorized releases.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25299, Health and Safety Code; 40 CFR 280.20, 280.40-280.45.

Amend Title 23, Division 3, Chapter 16, Article 3, to add new sections 2636.1, 2636.2, 2636.3, 2636.4 and 2637 of the California Code of Regulations as follows:

2636.1. Final Division Decisions Regarding Under-Dispenser Spill Containment or Control Systems

(a) A manufacturer of an under-dispenser spill containment or control system who disagrees with a determination by the Program Manager not to approve the manufacturer's system under section 2636(h)(3)(B) or to modify or revoke a previously issued approval of the manufacturer's system under section 2636(h)(3)(C) may ask for a review by the Division Chief.

(b) An appeal to the Division Chief must be in writing and must be accompanied by all material that the manufacturer wishes to be considered by the Division Chief, and by the Board in any subsequent review by the Board. The appeal must contain an explanation why the manufacturer believes the Program Manager's determination is erroneous, inappropriate, or improper.

(c) The Division Chief shall render a Final Division Decision within 30 days of receipt of the appeal. A Final Division Decision is final and conclusive unless the manufacturer files a petition for review with the Board that is received by the Board within 30 days from the date of the Final Division Decision.

(d) The Division Chief may at any time, on the Division Chief's own motion, issue a Final Division Decision.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.2. Petition for Board Review Regarding Under-Dispenser Spill Containment or Control Systems

(a) A manufacturer may petition the Board for review of a Final Division Decision.

(b) A petition for Board review shall contain the following:

(1) The name and address of the petitioner;

(2) A statement of the date on which the petitioner received the Division's final decision;

(3) A copy of the Final Division Decision that the Board is requested to review;

(4) An explanation why the petitioner believes the Final Division Decision is erroneous, inappropriate, or improper;

(5) A statement describing how the petitioner is damaged by the Final Division Decision; and

(6) A description of the remedy or outcome desired.

(c) The petition shall be sent to the Board Chairperson, with copies sent to the Chief Counsel of the Board, and the Division Chief.

(d) The petitioner may request a hearing for the purpose of presenting factual material not presented to the Division Chief or for oral argument or both. The request to present material that was not presented to the Division Chief must include a description of the factual material that the petitioner wishes to submit, the facts that the petitioner expects to establish, and an explanation of the reasons why the petitioner could not previously submit the new material to the Division Chief. The petitioner must include with the petition a copy of any new documentary material that the petitioner wishes to present to the Board.

(e) The Division Chief may file a response to the petition with the Board within 30 days of the Board's notification to the petitioner that the petition is complete. The Division must provide a copy of any response to the petitioner. The Board may extend the time for filing a response by the Division Chief.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.3. Defective Petitions

Upon the Board's receipt of a petition which does not comply with section 2636.2 of this chapter, the Board, through its Chief Counsel, will advise the petitioner of the manner in which the petition is defective and allow a reasonable time within which an amended petition may be filed. If the Board does not receive a properly amended petition within the time allowed, the petition shall be dismissed.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.4. Action by the Board Regarding Under-dispenser Spill Containment or Control Systems

(a) In response to the petition, the Board may:

(1) Refuse to review the petition if it is late or fails to raise substantial issues that are appropriate for Board review;

(2) Affirm the final decision that the Board has been requested to review;

(3) Set aside or modify the final decision that the Board has been requested to review; or

(4) Take such other action as the Board deems appropriate.

(b) Before taking action, the Board may, at its discretion, hold a hearing, or provide for an informal meeting between the petitioner, the Division Chief, a member of the Board, and such other persons as the Board deems appropriate for the purpose of attempting to resolve the dispute.

(c) If an evidentiary hearing is held, it shall be conducted in accordance with the California Code of Regulations, title 23, division 3, Chapter 1.5, article 2.

(d) The Board reserves the right, at its discretion, to consider a petition upon its own motion.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2637. *Secondary Containment Testing and Annual Maintenance Certification*

(a) Secondary containment systems installed on or after January 1, 2001 shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2003 and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) By December 31, 2002, the owner or operator of any secondary containment system that the owner or operator determines cannot be tested in accordance with this section shall replace the secondary containment system with a system that can be tested in accordance with this section. As an alternative, the owner or operator may submit a proposal and workplan for enhanced leak detection to the local agency in accordance with subdivisions 2644.1 (a)(1), (2), (4), and (5) by July 1, 2002; complete the program of enhanced leak detection by December 31, 2002; and replace the secondary containment system with a system that can be tested in accordance with this section by July 1, 2005. The local agency shall review the proposed program of enhanced leak detection within 45 days of submittal or re-submittal.

(2) Periodic testing of secondary containment systems shall be conducted using a test procedure that demonstrates that the system performs at least as well as it did upon installation. For example, if the secondary containment system was tested upon installation by using a test method that applied a pressure of 5 psi, then the periodic test must be conducted using a method that tests the system at an equivalent pressure. These tests shall be performed in accordance with manufacturer's guidelines or standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. If there are no applicable manufacturers guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer shall be used.

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002 the following shall also apply:

(1) Persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer by completion of a manufacturer's refresher course. Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Individuals employed by persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment for the purpose of conducting this work shall meet the requirements of 2637(b)(1)(B) and (C).

(3) Annual monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

(4) UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

(5) The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency.

(6) A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location

and shall include the date the UST component was certified, repaired, or replaced, and the contractor's license number.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

(2) Any period during which hazardous substances are stored in the tank, and no filling or withdrawal is conducted; and

(3) Any period between cessation of the storage of hazardous substances and the actual completion of closure, pursuant to Article 7, unless otherwise specified by the local agency, pursuant to section 2671(b), during a temporary closure period.

(c) This article shall not apply to underground storage tanks that are designed, constructed, installed, and monitored in accordance with ~~sections 2631 and 2632 or 2633 and 2634 of~~ Article 3.

(d) Owners or operators of tanks monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code shall comply with the requirements of section 2645. Tank systems having a capacity of more than 2,000 gallons shall not be monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code.

(e) An owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well, as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1. Additionally, the following conditions for enhanced leak detection shall apply:

(1) For the purpose of section 2644.1, vent or tank riser piping, vapor recovery piping, and suction piping that meet the definitions of section 2636(a)(1), (2), or (3), are not considered single-walled components.

(2) Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean

Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 60 calendar days of the date the notification was mailed. The Program Manager shall make a decision on the request, and notify the applicable local agency of this decision, within 90 calendar days of receipt of the request.

(3) The request for reconsideration must include the name and address of the subject facility, the name and address of the owner or operator submitting the request, and the reason(s) why the requester believes the board notification was in error. If the request is based on evidence that the UST system in question is greater than 1,000 feet from a public drinking water well, the request shall include a demonstration that the center of the well head is more than 1,000 ft from the closest component of the UST system. If the request is based on evidence that the subject UST system does not have a single-walled component, the request shall include supporting documentation. A copy of the request shall be concurrently submitted to the local agency.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40, 280.42 and 280.43(b).

2641. Monitoring Program Requirements

(a) Owners or operators of existing underground storage tanks subject to this article shall implement a monitoring program which is capable of detecting an unauthorized release from any portion of the underground storage tank system at the earliest possible opportunity.

(b) Underground piping shall be exempt from monitoring requirements if the local agency determines that the piping has been designed and constructed in accordance with section 2636(a)(3).

(c) All underground piping that operates at less than atmospheric pressure, unless it is exempt from monitoring under subsection (b), shall comply with the monitoring requirements of section 2643(d) and shall also include daily monitoring as described in Appendix II.

(d) All portions of the underground storage tank system shall be visually monitored in accordance with section 2642. A portion of the underground storage tank shall be exempt from visual monitoring if the owner demonstrates to the satisfaction of the local agency that one or more of the following conditions apply to that portion:

(1) It is not accessible for direct viewing;

(2) Visual inspection would be hazardous or would require the use of extraordinary personal protection equipment other than normal protective equipment such as steel-toed shoes, hard hat, or ear protection; or

(3) The underground storage tank is located at a facility which is not staffed on a daily basis.

(e) Non-visual monitoring shall be implemented for all portions of the underground storage tank which are exempt under subsection (d) and, for the underground storage tank, during periods when visual monitoring required under subsection (d) is not conducted. This non-visual monitoring shall include a quantitative release detection method as specified in section 2643 or a qualitative release detection method as specified in section 2644 or a combination of these methods as approved by the local agency.

(f) Non-visual monitoring for underground pressurized piping shall include a quantitative release detection method that complies with the performance requirements in section 2643(c)(1).

(g) The monitoring program shall be approved by the local agency and shall be in compliance with the requirements of this article and with the underground storage tank operating permit. The local agency may require additional monitoring methods specified in the operating permit or more frequent monitoring as necessary to satisfy the objective in subsection (a). In deciding whether to approve a proposed monitoring program, or to require additional methods or more frequent monitoring, the local agency shall consider the following factors:

(1) The volume and physical and chemical characteristics of the hazardous substance(s) stored in the underground storage tank;

(2) The compatibility of the stored hazardous substance(s) and any chemical-reaction product(s) with the function of monitoring equipment or devices;

(3) The reliability and consistency of the proposed monitoring equipment and systems under site-specific conditions;

(4) The depth and quantity of ground water and the direction of ground water flow;

(5) The patterns of precipitation in the region and any ground water recharge which occurs as a result of precipitation;

(6) The existing quality of ground water in the area, including other sources of contamination and their cumulative impacts;

(7) The current and potential future uses (e.g., domestic, municipal, agricultural, industrial supply) of ground water in the area;

(8) The proximity and withdrawal rates of ground water users in the area;

(9) The type, homogeneity, and range of moisture content of the backfill material and native soils and their probable effects on contaminant migration and detection;

(10) The presence of contamination in the excavation zone or surrounding soils;

(11) The proximity of the underground storage tank to surface waters; and

(12) Additional hydrogeologic characteristics of the zone surrounding the underground storage tank.

(h) The monitoring program shall include written monitoring procedures and a response plan as set forth in section 2632(d).

(i) If the local agency does not approve the monitoring program, the owner or operator shall replace, repair, upgrade, or close the tank in accordance with the applicable provisions of this chapter and local agency approval.

(j) Equipment and devices used to monitor underground storage tanks shall be installed, calibrated, operated, and maintained in accordance with section 2637(b). ~~manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.~~

(k) When an unauthorized release is indicated during the installation of a release detection system, the owner or operator shall comply with the release reporting requirements of Article 5 and, if the release came from the existing tank, shall cease the installation process until the tank system is replaced, repaired, upgraded, or closed in accordance with the applicable provisions of this chapter.

(l) When implementation of the monitoring program, or any condition, indicates that an unauthorized release may have occurred, the owner or operator shall comply with the release reporting requirements of Article 5 and shall replace, repair, or close the underground storage tank in accordance with the applicable provisions of this chapter.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25283, 25284.1, 25291 and 25292 Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, to add new section 2644.1 of the California Code of Regulations as follows:

2644.1 Enhanced Leak Detection

(a) An owner or operator who is required, pursuant to section 2640(e), to implement a program of enhanced leak detection or monitoring shall comply with the requirements of this section as follows:

(1) Enhanced leak detection means a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system.

(2) The enhanced leak detection test method shall be third party certified, in accordance with section 2643(f), for the capability of detecting both vapor and

liquid phase releases from the underground storage tank system. The enhanced leak detection test method shall be capable of detecting a leak rate of at least 0.005 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the local agency within 6 months following notification by the board The enhanced leak detection shall be implemented no later than 18 months following receipt of notification from the board and repeated every 36 months thereafter.

(4) Owners and operators of underground storage tanks subject to the requirements of this section must notify the local agency at least 48 hours prior to conducting the enhanced leak detection test unless this notification requirement is waived by the local agency.

(5) Owners and operators of underground storage tanks subject to the requirements of this section shall submit a copy of the enhanced leak detection test report to the board and the local agency within 60 days of completion of the test.

Authority cited: Sections 25299.3, and 25299.7, Health and Safety Code.
Reference: Sections 25283, 25291, 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows:

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping.

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998. <u>Requirements for under-dispenser containment, or under-dispenser spill control or containment systems, shall be completed no later than December 31, 2003.</u>

(i) As a preventive measure, an owner or operator may upgrade any underground storage tank constructed of any material which is not under pressure and which contains motor vehicle fuel as specified in sections 2662(a), (c), and (e). Before upgrading in accordance with this subsection, the owner or operator shall prove to the satisfaction of the local agency that the underground storage tank system has not caused an unauthorized release. If soil samples are taken, the owner or operator shall notify the local agency in advance of taking the samples.

(j) Owners or operators shall maintain records of repairs, linings, and upgrades that demonstrate compliance with the requirements of this article for the remaining operating life of the tank.

(k) Local agencies shall not approve a repair or upgrade unless it can be demonstrated that the underground storage tank system is structurally sound and the method of repair or upgrade will prevent unauthorized releases due to structural failure or corrosion during the operating life of the underground storage tank system.

(l) The materials used in the repair or upgrading process shall be applied in accordance with nationally recognized engineering practices.

(m) Materials used in repairs and upgrades shall be compatible with the existing underground storage tank system materials and shall not be subject to deterioration due to contact with the hazardous substance being stored.

(n) Steel underground storage tanks that exhibit external corrosion during the course of repair or upgrade shall comply with the cathodic protection requirements of section 2635(a)(2).

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections <u>25284.1</u>, 25292, 25292.1 and 25296, Health and Safety Code; 40 CFR 280.21, 280.33 and 281.32(d)

2666. Requirements for Upgrading Underground Piping.

(a) By December 22, 1998, all underground piping containing hazardous substances other than motor vehicle fuel shall be retrofitted with secondary containment meeting the requirements of section 2636.

(b) By December 22, 1998, all underground piping containing motor vehicle fuel and connected to an existing tank shall be retrofitted with secondary containment unless the owner or operator demonstrates to the local agency that the piping is constructed of fiberglass reinforced plastic, cathodically protected steel, or other materials compatible with stored products and resistant to corrosion. The secondary containment system shall meet the construction, installation, and monitoring requirements of section 2636.

(c) By December 22, 1998, all automatic line leak detectors for underground pressurized piping which is not secondarily contained shall be capable of shutting off the pump when a release occurs. In addition, the pumping system shall shut down automatically if the automatic line leak detector fails or is disconnected. In lieu of the above, for underground storage tank emergency generator systems, the leak detector must be connected to an audible and visible alarm to indicate a release or malfunction of the system.

(d) All underground piping and secondary containment shall be tested for tightness after installation in accordance with section 2636(e).

(e) By December 31, 2003, all existing underground storage tanks shall be retrofitted with under-dispenser containment, or an under-dispenser spill containment or control system. The under-dispenser containment or under-dispenser spill containment or control system shall meet, where applicable, the requirements of 2636(h)(2), or 2636(h)(3).

Authority cited : Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, 25292 and 25292.1, Health and Safety Code; 40 CFR 280.21.

MONITORING SYSTEM CERTIFICATION

For Use By All Jurisdictions Within the State of California
Authority Cited: Chapter 6.7, Health and Safety Code; Chapter 16, Division 3, Title 23, California Code of Regulations

This form must be used to document testing and servicing of monitoring equipment. A separate certification or report must be prepared for each monitoring system control panel by the technician who performs the work. A copy of this form must be provided to the tank system owner/operator. The owner/operator must submit a copy of this form to the local agency regulating UST systems within 30 days of test date.

A. General Information

Facility Name: ______________________________ Bldg. No.: __________

Site Address: ______________________________ City: ______________ Zip: __________

Facility Contact Person: ______________________________ Contact Phone No.: (______)__________

Make/Model of Monitoring System: ______________________________ Date of Testing/Servicing: ___/___/___

B. Inventory of Equipment Tested/Certified

Check the appropriate boxes to indicate specific equipment inspected/serviced:

Tank ID: ____________	**Tank ID:** ____________
☐ In-Tank Gauging Probe. Model: ________	☐ In-Tank Gauging Probe. Model: ________
☐ Annular Space or Vault Sensor. Model: ________	☐ Annular Space or Vault Sensor. Model: ________
☐ Piping Sump / Trench Sensor(s). Model: ________	☐ Piping Sump / Trench Sensor(s). Model: ________
☐ Fill Sump Sensor(s). Model: ________	☐ Fill Sump Sensor(s). Model: ________
☐ Mechanical Line Leak Detector. Model: ________	☐ Mechanical Line Leak Detector. Model: ________
☐ Electronic Line Leak Detector. Model: ________	☐ Electronic Line Leak Detector. Model: ________
☐ Tank Overfill / High-Level Sensor. Model: ________	☐ Tank Overfill / High-Level Sensor. Model: ________
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).
Tank ID: ____________	**Tank ID:** ____________
☐ In-Tank Gauging Probe. Model: ________	☐ In-Tank Gauging Probe. Model: ________
☐ Annular Space or Vault Sensor. Model: ________	☐ Annular Space or Vault Sensor. Model: ________
☐ Piping Sump / Trench Sensor(s). Model: ________	☐ Piping Sump / Trench Sensor(s). Model: ________
☐ Fill Sump Sensor(s). Model: ________	☐ Fill Sump Sensor(s). Model: ________
☐ Mechanical Line Leak Detector. Model: ________	☐ Mechanical Line Leak Detector. Model: ________
☐ Electronic Line Leak Detector. Model: ________	☐ Electronic Line Leak Detector. Model: ________
☐ Tank Overfill / High-Level Sensor. Model: ________	☐ Tank Overfill / High-Level Sensor. Model: ________
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).
Dispenser ID: ____________	**Dispenser ID:** ____________
☐ Dispenser Containment Sensor(s). Model: ________	☐ Dispenser Containment Sensor(s). Model: ________
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
Dispenser ID: ____________	**Dispenser ID:** ____________
☐ Dispenser Containment Sensor(s). Model: ________	☐ Dispenser Containment Sensor(s). Model: ________
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
Dispenser ID: ____________	**Dispenser ID:** ____________
☐ Dispenser Containment Sensor(s). Model: ________	☐ Dispenser Containment Sensor(s). Model: ________
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).

*If the facility contains more tanks or dispensers, copy this form. Include information for every tank and dispenser at the facility.

C. Certification

- I certify that the equipment identified in this document was inspected/serviced in accordance with the manufacturers' guidelines. Attached to this Certification is information (e.g. manufacturers' checklists) necessary to verify that this information is correct and a Plot Plan showing the layout of monitoring equipment. For any equipment capable of generating such reports, I have also attached a copy of the report; *(check all that apply)*: ☐ System set-up ☐ Alarm history report

Technician Name (print): ______________________ Signature: ______________________

Certification No.: ______________________ License. No.: ______________________

Testing Company Name: ______________________ Phone No.: (______)__________

Site Address: ______________________ Date of Testing/Servicing: ___/___/___

D. Results of Testing/Servicing

Software Version Installed: ______________________________

Complete the following checklist:

❑ Yes	❑ No*	Is the audible alarm operational?
❑ Yes	❑ No*	Is the visual alarm operational?
❑ Yes	❑ No*	Were all sensors visually inspected, functionally tested, and confirmed operational?
❑ Yes	❑ No*	Were all sensors installed at lowest point of secondary containment and positioned so that other equipment will not interfere with their proper operation?
❑ Yes	❑ No* ❑ N/A	If alarms are relayed to a remote monitoring station, is all communications equipment (e.g. modem) operational?
❑ Yes	❑ No* ❑ N/A	For pressurized piping systems, does the turbine automatically shut down if the piping secondary containment monitoring system detects a leak, fails to operate, or is electrically disconnected? If yes: which sensors initiate positive shut-down? *(Check all that apply)* ❑ Sump/Trench Sensors; ❑ Dispenser Containment Sensors. Did you confirm positive shut-down due to leaks and sensor failure/disconnection? ❑ Yes; ❑ No.
❑ Yes	❑ No* ❑ N/A	For tank systems that utilize the monitoring system as the primary tank overfill warning device (i.e. no mechanical overfill prevention valve is installed), is the overfill warning alarm visible and audible at the tank fill point(s) and operating properly? If so, at what percent of tank capacity does the alarm trigger? ________%
❑ Yes*	❑ No	Was any monitoring equipment replaced? If yes, identify specific sensors, probes, or other equipment replaced and list the manufacturer name and model for all replacement parts in Section E, below.
❑ Yes*	❑ No	Was liquid found inside any secondary containment systems designed as dry systems? *(Check all that apply)* ❑ Product; ❑ Water. If yes, describe causes in Section E, below.
❑ Yes	❑ No*	Was monitoring system set-up reviewed to ensure proper settings? Attach set up reports, if applicable
❑ Yes	❑ No*	Is all monitoring equipment operational per manufacturer's specifications?

*** In Section E below, describe how and when these deficiencies were or will be corrected.**

E. Comments: ______________________________

F. In-Tank Gauging / SIR Equipment:

☐ Check this box if tank gauging is used only for inventory control.
☐ Check this box if no tank gauging or SIR equipment is installed.

This section must be completed if in-tank gauging equipment is used to perform leak detection monitoring.

Complete the following checklist:

☐ Yes	☐ No*	Has all input wiring been inspected for proper entry and termination, including testing for ground faults?
☐ Yes	☐ No*	Were all tank gauging probes visually inspected for damage and residue buildup?
☐ Yes	☐ No*	Was accuracy of system product level readings tested?
☐ Yes	☐ No*	Was accuracy of system water level readings tested?
☐ Yes	☐ No*	Were all probes reinstalled properly?
☐ Yes	☐ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

G. Line Leak Detectors (LLD):

☐ Check this box if LLDs are not installed.

Complete the following checklist:

☐ Yes	☐ No* ☐ N/A	For equipment start-up or annual equipment certification, was a leak simulated to verify LLD performance? *(Check all that apply)* Simulated leak rate: ☐ 3 g.p.h.; ☐ 0.1 g.p.h ; ☐ 0.2 g.p.h.
☐ Yes	☐ No*	Were all LLDs confirmed operational and accurate within regulatory requirements?
☐ Yes	☐ No*	Was the testing apparatus properly calibrated?
☐ Yes	☐ No* ☐ N/A	For mechanical LLDs, does the LLD restrict product flow if it detects a leak?
☐ Yes	☐ No* ☐ N/A	For electronic LLDs, does the turbine automatically shut off if the LLD detects a leak?
☐ Yes	☐ No* ☐ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system is disabled or disconnected?
☐ Yes	☐ No* ☐ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system malfunctions or fails a test?
☐ Yes	☐ No* ☐ N/A	For electronic LLDs, have all accessible wiring connections been visually inspected?
☐ Yes	☐ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

**** In the Section H, below, describe how and when these deficiencies were or will be corrected.***

H. Comments: ______________________________

UST Monitoring Plot Plan

Site Address: ____

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

February 22, 2001

Justification for Early Effective Date of Proposed Regulations
(Government Code 11346.4(c))

The State Water Resources Control Board requests that the proposed SB 989 regulations become effective on the date of filing with the Secretary of State because the regulations have been unintentionally delayed, and both statutory and regulatory deadlines relating to the proposed regulations have passed.

STATE OF CALIFORNIA--OFFICE OF ADMINISTRATIVE LAW

NOTICE PUBLICATION/REGULATIONS SUBMISSION

(See instructions on reverse)

For use by Secretary of State only

STD. 400 (REV. 4-99)

OAL FILE NUMBERS	NOTICE FILE NUMBER	REGULATORY ACTION NUMBER	EMERGENCY NUMBER
	Z-00-0502-05		

For use by Office of Administrative Law (OAL) only

RECEIVED FOR FILING MAY 02 '00

PUBLICATION DATE MAY 12 '00

Office of Administrative Law

NOTICE

REGULATIONS

AGENCY WITH RULEMAKING AUTHORITY

AGENCY FILE NUMBER *(If any)*

A. PUBLICATION OF NOTICE *(Complete for publication in Notice Register)*

1. SUBJECT OF NOTICE	TITLE(S)	FIRST SECTION AFFECTED	2. REQUESTED PUBLICATION DATE
UNDERGROUND STORAGE TANKS	23	2611	May 12, 2000

3. NOTICE TYPE	4. AGENCY CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER *(Optional)*
☑ Notice re Proposed Regulatory Action ☐ Other	Charles NeSmith	(916) 227-4377	(916) 227-4349

OAL USE ONLY	ACTION ON PROPOSED NOTICE	NOTICE REGISTER NUMBER	PUBLICATION DATE
	☐ Approved as Submitted ☑ Approved as Modified ☐ Disapproved/Withdrawn	2000, 19-Z	5/12/00

B. SUBMISSION OF REGULATIONS *(Complete when submitting regulations)*

1a. SUBJECT OF REGULATION(S)

1b. ALL PREVIOUS RELATED OAL REGULATORY ACTION NUMBER(S)

2. SPECIFY CALIFORNIA CODE OF REGULATIONS TITLE(S) AND SECTION(S) *(Including title 26, if toxics-related)*

TION(S) AFFECTED *(List all section number(s) individually)*

ADOPT

AMEND

TITLE(S)

REPEAL

3. TYPE OF FILING

☐ Regular Rulemaking (Gov. Code, § 11346)
☐ Resubmittal of disapproved or withdrawn nonemergency filing (Gov. Code, §§ 11349.3, 11349.4)
☐ Emergency (Gov. Code, § 11346.1(b))
☐ Emergency Readopt (Gov. Code, § 11346.1(h))
☐ Resubmittal of disapproved or withdrawn emergency filing (Gov. Code, § 11346.1)

☐ Certificate of Compliance: The agency officer named below certifies that this agency complied with the provisions of Government Code §§ 11346.2 - 11346.9 prior to, or within 120 days of, the effective date of the regulations listed above.

☐ Print Only ☐ Changes Without Regulatory Effect (Cal. Code Regs., title 1, § 100) ☐ Other (specify)

4. ALL BEGINNING AND ENDING DATES OF AVAILABILITY OF MODIFIED REGULATIONS AND/OR MATERIAL ADDED TO THE RULEMAKING FILE *(Cal. Code Regs. title 1, §§ 44 and 45)*

5. EFFECTIVE DATE OF REGULATORY CHANGES *(Gov. Code, §§ 11343.4, 11346.1(d))*

☐ Effective 30th day after filing with Secretary of State ☐ Effective on filing with Secretary of State ☐ Effective other *(Specify)*

6. CHECK IF THESE REGULATIONS REQUIRE NOTICE TO, OR REVIEW, CONSULTATION, APPROVAL OR CONCURRENCE BY, ANOTHER AGENCY OR ENTITY

☐ Department of Finance (Form STD. 399) (SAM §6660) ☐ Fair Political Practices Commission ☐ State Fire Marshal

☐ Other (Specify)

7. CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER *(Optional)*	E-MAIL ADDRESS *(Optional)*
	( )	( )	

8.

I certify that the attached copy of the regulation(s) is a true and correct copy of the regulation(s) identified on this form, that the information specified on this form is true and correct, and that I am the head of the agency taking this action, or designee of the head of the agency, and am authorized to make this certification.

SIGNATURE OF AGENCY HEAD OR DESIGNEE

DATE

TYPED NAME AND TITLE OF SIGNATORY

STATE OF CALIFORNIA--OFFICE OF ADMINISTRATIVE LAW

NOTICE PUBLICATION/REGULATIONS SUBMISSION

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SECTION(S) AFFECTED *(List all section number(s) individually)*	ADOPT
	AMEND
TITLE(S)	REPEAL

3. TYPE OF FILING

☐ Regular Rulemaking *(Gov. Code, § 11346)*

☐ Resubmittal of disapproved or with-drawn nonemergency filing *(Gov. Code, §§ 11349.3, 11349.4)*

☐ Emergency (Gov. Code, § 11346.1(b))

☐ Emergency Readopt (Gov. Code, § 11346.1(h))

☐ Resubmittal of disapproved or withdrawn emergency filing (Gov. Code, § 11346.1)

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☐ Print Only

☐ Changes Without Regulatory Effect (Cal. Code Regs., title 1, § 100)

☐ Other (specify)

4. ALL BEGINNING AND ENDING DATES OF AVAILABILITY OF MODIFIED REGULATIONS AND/OR MATERIAL ADDED TO THE RULEMAKING FILE *(Cal. Code Regs. title 1, §§ 44 and 45)*

5. EFFECTIVE DATE OF REGULATORY CHANGES *(Gov. Code, §§ 11343.4, 11346.1(d))*

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☐ Department of Finance (Form STD. 399) (SAM §6660)

☐ Fair Political Practices Commission

☐ State Fire Marshal

☐ Other (Specify)

7. CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER *(Optional)*	E-MAIL ADDRESS *(Optional)*
	( )	( )	

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I certify that the attached copy of the regulation(s) is a true and correct copy of the regulation(s) identified on this form, that the information specified on this form is true and correct, and that I am the head of the agency taking this action, or a designee of the head of the agency, and am authorized to make this certification.

SIGNATURE OF AGENCY HEAD OR DESIGNEE	DATE

TYPED NAME AND TITLE OF SIGNATORY

A. FINAL TEXT OF REGULATIONS
(attached to original form 400)

LINK WITH ABOVE TABS

III. NOTICE OF PROPOSED RULEMAKING (including plain English summary)

TITLE 23: CALIFORNIA CODE OF REGULATIONS

WATERS

DIVISION 3: STATE WATER RESOURCES CONTROL BOARD

CHAPTER 16: UNDERGROUND STORAGE TANK REGULATIONS

NOTICE OF PROPOSED RULEMAKING

NOTICE IS HEREBY GIVEN THAT THE STATE WATER RESOURCES CONTROL BOARD PROPOSES TO ADOPT AMENDMENTS TO THE UNDERGROUND STORAGE TANK REGULATIONS AFTER CONSIDERING ALL COMMENTS, OBJECTIONS AND RECOMMENDATIONS REGARDING THE PROPOSED ACTION

PROPOSED REGULATORY ACTION: The State Water Resources Control Board (SWRCB) proposes to amend sections 2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, and 2666, and add new sections 2636.1, 2636.2, 2636.3, 2636.4, 2637 and 2644.1 in Title 23 of the California Code of Regulations (CCR). These sections concern underground storage tanks.

PUBLIC HEARING AND WRITTEN COMMENT PERIOD

The SWRCB will hold a public hearing on the proposed regulations at 10 a.m. on July 18, 2000, in conference room "C", County of Los Angeles Department of Public Works, 900 S. Fremont Ave, Alhambra. At the public hearing, any person may present statements or arguments that are relevant to the proposed regulations described in the informative digest, either orally, or in writing. Written comments not presented at the public hearing will be considered by the SWRCB if they are received prior to 5:00 p.m. on the date of the hearing. Submit written comments to: Charles NeSmith, State Water Resources Control Board, Division of Clean Water Programs, 2014 "T" Street, P.O. Box 944212, Sacramento, CA, 94244-2120.

Representatives of the SWRCB will preside at the hearing. Persons who wish to speak are requested to register prior to the hearing. Pre-hearing registration will be conducted at the location of the hearing from 9:30 to 10:00 a.m. Registered persons will be heard in the order of their registration. Any other person wishing to speak at the hearing will be afforded the opportunity after the registered persons have been heard.

Reasonable accommodation or sign language interpreting services at the public hearing will be provided upon request. Such request should be made no later than 15 days prior to the public hearing date.

AUTHORITY AND REFERENCE

Water Code sections 185 and 1058, and Health and Safety Code (HSC) sections 25299.3, and 25299.7, authorize the SWRCB to adopt the proposed regulations which would implement HSC sections 25284.1 and 25292.4, enacted through Senate Bill 989 (stats.1999, ch 812).

INFORMATIVE DIGEST / PLAIN ENGLISH OVERVIEW

(1) Management of Underground Storage Tanks in California is regulated under both federal and State law. Applicable federal law is found in the Resource Conservation and Recovery Act (RCRA) Subtitle I, Section 9003. Regulations implementing federal laws are found in 40 CFR, part 280. Section 9004, RCRA Subtitle I, permits the U.S.EPA (EPA) to authorize states to implement their own UST programs in place of the federal requirements if the state's requirements are "no less stringent" than EPA's, and provide for adequate enforcement. Applicable state law is incorporated into Health and Safety Code (HSC) Chapter 6.7, commencing with section 25280, and related regulations in Title 23, Division 3, Chapter 16, California Code of Regulations (CCR).

The California legislature enacted HSC Chapter 6.7 in 1984 and has since amended Chapter 6.7 in response to either federal mandates relating to underground storage tanks (UST), or new information regarding changing industry practices and/or the performance of UST's meeting then current UST regulatory standards in California. In October 1999, the legislature again amended Chapter 6.7 by enacting Senate Bill 989, which essentially codifies executive order D-5-99. This executive order was the Governor's response to a University of California report on the environmental impacts of Methyl Tertiary Butyl Ether (MTBE) -- an additive put into motor vehicle fuel beginning in the late 1980's, early 90's. The executive order requires the phase-out of MTBE in fuel by December 31, 2002.

The University report concluded that, "while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water." This finding was in stark contrast to an earlier study by the Lawrence Livermore National Laboratory regarding leaks of "pre-MTBE" motor vehicle fuel. This study concluded that groundwater plumes resulting from leaking underground storage tanks were very limited in extent (less than 250 feet), and rarely impacted public drinking water supplies. In comparing the different studies, the relative mobility and persistence in the environment of MTBE versus the most mobile constituents of "pre-MTBE" fuel (i.e. benzene, toluene, ethylbenzene, and xylenes) was illuminated, thus resulting in the subject legislation.

Since current underground storage tank laws and regulations were promulgated absent this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with more stringent construction and monitoring standards for underground storage tanks. These new construction and monitoring requirements were mostly based on the recommendations of two SWRCB panels, the Advisory Panel on the Leak History of New and Upgraded UST Systems (Leak History Panel) and the California Leak Monitoring group (CALM). The proposed regulations, where necessary, implement, interpret, and make specific, newly enacted legislation regarding UST installers, secondary containment testing, under-dispenser containment, annual maintenance certification, and leak detection for single-walled UST's.

(2) Under existing California regulations, UST installers are required to receive adequate training by the tank and piping manufacturers whose equipment is being installed (23 CCR 2635(d)(1)). This may, or may not, include re-certification depending on the manufacturers training standards. Comparable federal regulations regarding tank installations are found in 40 CFR section 280.20(d) and (e). Federal regulations allow several options for certifying that a tank installation has been done properly including certification of the installer by the manufacturer, or the implementing agency. However, installer certification is not mandatory.

The proposed additional requirements for UST system installers make specific Health and Safety Code (HSC) subsection 25284.1(a)(4)(A), which mandates the SWRCB to adopt regulations requiring underground storage tank installers to meet minimum training standards. The new requirements simply require UST system installers to be re-certified every 36 months by the manufacturer of the equipment being installed.

The new requirement for tank installer re-certification will help to ensure that UST systems are installed properly by mandating that UST installers maintain currency, both in general terms of tank installing, but more specifically, with the type of system being installed.

(3) Under existing California regulations, secondary containment systems are required to be tested upon installation (23 CCR 2635(a)(4)). There are no comparable federal regulations for testing of secondary containment. The proposed secondary containment testing regulations implement HSC subsection 25284.1(a)(4)(B) and require UST owners and operators to conduct secondary containment testing every 36 months. The testing must be done to the same standards that were used when the secondary containment system was tested at installation.

Secondary containment systems that cannot be periodically tested because of their inherent design, such as open secondary containment "lined-trench" systems, are given an alternative to secondary containment testing for an interim 5 year period. At the end of this period, the secondary containment system must either be removed, or tested in accordance with an appropriate, workable, testing method developed within the interim period. Conversely, secondary containment systems that automatically continuously test the secondary containment system by virtue of their design are exempted from secondary containment testing requirements.

Periodic testing of secondary containment systems will provide greater assurance that double-walled UST systems are performing as designed and capable of capturing and containing any leaks from the primary containment. A defective secondary containment system can, under certain conditions, be a greater threat to the environment than a single-walled system. This is because a significant leak may occur in a defective secondary containment system, without triggering an audible or visual alarm, and get into the environment while all concerned continue to believe the system remains tight.

(4) Under-dispenser containment has been a requirement in California since July 1, 1987 when all UST piping installed after that date was required to have secondary containment (HSC 25291(a)(7)(E)). This requirement includes piping located under, and connected to, the dispenser. There are no comparable federal regulations regarding under-dispenser containment.

The specific under-dispenser requirements codified in HSC 25284.1(a)(5) clarify previous law, and also mandate under-dispenser containment for UST systems installed prior to July 1, 1987. This includes all single-walled UST systems. The proposed regulations implement these new requirements. Additionally, the SWRCB has included regulatory language clarifying that under-dispenser containment must be continuously monitored and connected to an audible and visual alarm. Furthermore, the proposed under-dispenser containment regulations also clarify, and implement, the provision in HSC 25284.1(a)(5) that requires the SWRCB to approve alternate under-dispenser containment referred to in Senate Bill 989 as dispenser "spill containment or control systems" capable of containing any accidental release.

The new under-dispenser containment requirements will provide additional protection for soil and groundwater from fuel leaks at the piping connection point at the fuel dispenser. While dispenser leaks are usually small and slow, if allowed to continue for a long period as they often are, soil and groundwater can be significantly impacted. Again, any MTBE that gets into groundwater from these small leaks may migrate relatively quickly, both horizontally and vertically, in the aquifer system.

(5) Under existing California regulations, UST systems must receive annual maintenance and service checks (23 CCR 2630(d)), however, existing regulations do not impose any licensing, training or certification requirements on persons who perform this work. The proposed regulations implement and make specific HSC subsection 25284.1(a)(5)(D), and require persons conducting annual maintenance inspections to have a contractors license, be trained and certified by the manufacturer of the monitoring equipment being inspected, and be re-certified by the manufacturer every 36 months.

The proposed regulations will increase the reliability of annual maintenance work for UST monitoring systems by: 1) requiring trained personnel to conduct the work; and 2) requiring that the inspections be carefully documented on a certification form prepared by the SWRCB.

(6) Under existing California regulations, single-walled UST systems are required to be periodically monitored for leaks that may occur in the tank and/or piping (23 CCR Chapter 16, Article 4). Owners and Operators of these systems are given several options for meeting this requirement, including use of an automatic tank gauge, statistical inventory reconciliation, vapor or ground water monitoring wells, etc. Similar federal leak detection requirements are found in 40 CFR 280 subpart D.

The proposed leak detection requirements implement HSC section 25292.4, which requires enhanced (i.e. additional) leak detection for UST systems with a single-walled component located within 1,000 feet of a public drinking water supply. The SWRCB has interpreted and made specific HSC 25292.4 by: 1) clarifying that vent or tank riser piping, vapor recovery, and suction piping, are not included as single-walled components; 2) providing a means for owners and operators to petition the SWRCB's identification of their facility as being within 1,000 feet of a public drinking water supply; 3) interpreting the legislature's November 1, 2000 deadline for implementing a program of enhanced leak detection as the deadline for submittal of an enhanced leak detection workplan, and allowing an additional year, from the submittal deadline, to perform the first enhanced leak detection event followed by a triennial testing interval; and 4) limiting acceptable enhanced leak detection methods only to those cost-effective techniques that can accurately determine the location of a leak, and determine if the leak came from the tank system, from spills or overfills, or from previous tank operations.

Public drinking water supplies will have greater protection against leaking fuel containing MTBE, from single-walled systems (within 1,000 ft) through the proposed enhanced leak detection requirements. Even the most well maintained and operated single-walled tank systems may leak below minimum leak detection sensitivities, and thus these small leaks go undetected. Any MTBE that gets into groundwater from these small leaks may migrate relatively quickly, both horizontally and vertically, in the aquifer system and thus may reach nearby public drinking water wells.

FISCAL IMPACT ESTIMATES

Mandates on Local Agencies and School districts pursuant to Part 7 (commencing with Section 17500) of Division 4 of the Government Code: The SWRCB has determined that the proposed amendments would not impose a mandate on local agencies or school districts nor are there any costs for which reimbursement is required by Part 7 (commencing with Section 17500) of Division 4 of the Government Code.

Cost or Savings to any State Agency: State agencies that own or operate underground storage tanks (UST's) may incur additional costs as a result of the proposed regulations depending on the type of system installed. The most significant additional cost will be for those systems that must install under-dispenser containment in accordance with the proposed regulations. Based on information provided from various state agencies, the SWRCB estimates that: 1) 77 state-owned facilities will need to install under-dispenser containment (from \$3,000 to \$50,000 per facility); 2) 205 facilities will need to conduct periodic secondary containment testing (up to \$512,500 in the first year and \$171,000 annually thereafter); and 3) 34 facilities will need to conduct enhanced leak detection (\$ 144,000 initially and annual average of \$16,500 thereafter). The SWRCB is unaware of any state-owned UST facilities that have lined trench systems.

The total first year estimated cost to the state as a result of the proposed regulations is \$887,000 to \$ 4.5 million dollars. Average ongoing state cost will be \$187,600 annually. The SWRCB expects that state agencies will not be able to absorb these additional costs within their existing budgets and resources.

Other Non-discretionary Costs or Savings to Local Agencies: Local agencies that own or operate UST's may incur additional costs as a result of the proposed regulations depending on the type of system installed. However, the costs imposed by these regulations are incidental to laws of a general application, do not apply uniquely to local governments, and do not add or increase the service from the local government to the public and therefore are not subject to reimbursement pursuant to sections listed above. Obviously, this analysis does not apply to the local government's cost to carry out the enforcement of SB 989; however, local governments can recover those costs through increased fees under Health and Safety Code section 25287, subdivision (a).

Local agencies may also be subject to additional paperwork as a result of handling facility reports containing the results of secondary containment testing and enhanced leak detection, and as a result of reviewing enhanced leak detection program workplans. The SWRCB has determined that the extra local agency staff time needed to handle the additional paperwork will be insignificant, and thus the resulting costs will be insignificant.

ECONOMIC IMPACT ESTIMATES

Statement of Significant Adverse Economic Impact on California Businesses: The SWRCB has determined that the proposed regulations may have a significant adverse impact on businesses. As such, pursuant to Government Code section 11346.5(a)(7)(C) the SWRCB is required to make the following statement:

The SWRCB finds that the adoption/amendment of the proposed regulations may have a significant adverse economic impact on businesses, including the ability of California businesses to compete with businesses in other states. The SWRCB has considered proposed alternatives that would lessen any adverse economic impact on business and invites you to submit proposals. Submissions may include the following considerations:

(1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to businesses.

(2) Consolidation or simplification of compliance and reporting requirements for businesses.

(3) The use of performance standards rather than prescriptive standards.

(4) Exemption or partial exemption from the regulatory requirements for businesses.

However, the SWRCB has determined that the proposed regulations will not have a significant adverse affect on the ability of California businesses to compete with other businesses in other states. This is because, at the retail level, motor vehicle fuel is sold locally and thus fuel service stations in other states cannot take away the sales of fuel from California fuel service stations.

Types of Businesses Affected: Any business that owns or operates a UST system that is not categorically exempt from the UST regulations may be affected by the proposed regulations. These businesses are mostly retail fuel service stations either owned or leased-out by major petroleum distributors, or small, independently owned facilities. Other businesses affected include those that own or operate UST's for their own use, such as factories, equipment rental yards, construction companies, mines, etc.

Projected Reporting, Recordkeeping, and Other Compliance Requirements: Owners or Operators of UST systems will need to keep additional periodic records regarding secondary containment testing and enhanced leak detection (where applicable), and report them to the local agency. This will simply involve filing the results of these activities that are given to them by the contractors conducting the work, and also mailing, or submitting in person, the results to the local agency. Since periodic reporting of other UST related activities is already required, the cost of the additional reporting requirements will be insignificant.

Potential Impact on Private Persons or Businesses Directly Affected: Private persons who own UST's for their personal use may be affected by the proposed regulations depending on the system installed. The number and type of privately owned UST's in California is unknown, thus the total cost to private persons is unknown. However, on an individual basis, private UST owners will be subject to the costs detailed below for businesses, where applicable.

The proposed state mandated regulations will cause California businesses (mostly gasoline retail facilities) to incur new costs, from relatively minor periodic expenses for secondary containment testing ($2,500 triennially), to major expenses, up to $50,000 per facility, for installation of under-dispenser containment (UDC), and up to $150,000, for replacement of lined-trench systems where applicable. The amount of expense for each facility will depend on UST construction (i.e. double-walled or single-walled / currently has under-dispenser containment or not) and its location relative to public drinking water wells (i.e. within 1,000 feet some additional requirements apply). However, with the exception of the relatively few facilities that have secondary containment that cannot be periodically tested, the cost for a standard retrofit installation of under-dispenser containment (i.e. concrete broken and dispensers removed) far outweighs all the other new costs combined. As such, this requirement alone will likely be the deciding factor relating to business decisions based on the proposed regulations.

Underground Storage Tank facilities owned and/or leased-out by major petroleum distributors are not likely to go out of business because of the under-dispenser containment requirements or replacement of lined-trench systems. However, small "mom and pop" owners of single-walled UST facilities, or those that have lined-trench systems, may not be able to absorb the additional costs and will have to sell or close. This is all the more likely given that these UST facility owners recently spent a significant amount of money upgrading their UST systems to the December 22, 1998 upgrade standards.

Tank installers will incur additional costs due to the new re-certification requirements in cases where the tank manufacturer does not already require re-certification. Persons who conduct annual monitoring maintenance certification, and currently do not have an appropriate contractors license, will incur new costs in obtaining that license and for periodic re-certification by the manufacturer of the equipment being tested. Persons who conduct annual monitoring maintenance certification, and currently have the appropriate contractors license, will incur new costs for periodic re-certification by the manufacturer of the equipment being tested.

The SWRCB estimates that there are 1500 tank installers in California. The number of persons conducting annual monitoring maintenance certification is unknown.

The SWRCB estimates that approximately 6,784 businesses in California will be impacted by the proposed regulations. The estimated total cost range for California businesses to comply with all of the proposed regulations is $81 million to $339 million dollars over a five year period. The breakdown for the cost of compliance for each new requirement is as follows:

1. Installation of Under-dispenser containment: **$16,447,155 to $274,119,244**

2. Secondary Containment Testing: **$59,794,808 over 5 years**

3. Enhanced Leak Detection: **$3,715,528 over 5 years**

4. Tank Installer Training: **$1,500,000 over 5 years**

5. Annual Maintenance Certification: **Approximately $500 to obtain contractors license. The number of persons conducting annual maintenance certification inspections is unknown.**

Affect on the Creation or Elimination of Jobs within California: Jobs may be lost in California to the extent that facilities close and remain closed due to the economic impact of the new requirements as described above but this most likely will be offset by increased jobs in new or expanded facilities. The number of "mom and pop" UST facilities currently operating in California is unknown. Approximately 350 UST facilities in California have lined trench secondary containment systems, nearly all of which are owned and/or leased-out by major petroleum distributors.

Jobs will be created by the new requirements for contractors and their employees who install UST's, test secondary containment systems, or are capable of conducting enhanced leak detection.

Affect on the Creation of New Businesses or Elimination of Existing Businesses within California: The creation of new, or elimination of existing, businesses in California will likely be affected by the proposed regulations in same manner as the creation or elimination of jobs, described above. Small business UST facilities constructed with single-walled tank systems, or lined-trench secondary containment systems, may be forced out of business by the proposed requirements. However, new contracting businesses may be started to fill the need for installation of under-dispenser containment, or for development and installation of alternatives to under-dispenser containment that are approved by the SWRCB.

Affect on the Expansion of Businesses Currently Doing Business in California: The proposed regulations will not have a significant adverse affect on the expansion of businesses currently doing business in California. The requirement for under-dispenser containment for UST's at the time of installation is not a new requirement, rather it is a clarification of a previous requirement for secondary containment of all UST piping systems installed after July 1, 1987. Given this, new installations of UST systems will not incur any additional costs relating to under-dispenser containment, and thus the under-dispenser containment requirement will not deter businesses from installing new UST facilities that would have been installed prior to the proposed regulations.

Additionally, new contracting businesses may be started, or existing ones expanded, to fill the need for installation of under-dispenser containment, for development and installation of alternatives to under-dispenser containment that are approved by the SWRCB, or for replacement of lined-trench systems.

Potential Significant Impact on Housing Costs: None.

AFFECT ON SMALL BUSINESS

The proposed regulations may impact small businesses that own or operate a UST system that is not categorically exempt from the UST regulations, or small businesses that conduct work related to underground storage tank construction, monitoring, or maintenance.

> *The SWRCB has determined that it is not feasible to draft the regulations in plain English due to the technical nature of the regulations; however, a non-controlling plain English summary is available from the agency contact person named in this notice.*

CONSIDERATION OF ALTERNATIVES

In accordance with Government Code section 11346.5(a)(12), the SWRCB must determine that no alternative considered by the SWRCB would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons, than the proposed action.

AVAILABILITY OF STATEMENT OF REASONS AND TEXT OF PROPOSED REGULATIONS

The SWRCB has prepared for public review: 1) an initial statement of reasons for the proposed amendments; 2) a rulemaking record which contains all of the information upon which the proposed amendments are based, and 3) the text of the proposed amendments. A copy of the initial statement of reasons, and a copy of the text and the express terms of the proposed amendments, are available upon request by writing to the SWRCB, attention Cheryl Smith, Division of Clean Water Programs, Underground Storage Tank Program, 2014 "T" Street, P.O. Box 944212, Sacramento, CA, 94244-2120. This address is also the location of public records, including reports, documentation, and other material related to the proposed amendments.

AVAILABILITY OF CHANGED OR MODIFIED TEXT

After the close of the comment period, the SWRCB may adopt the proposed regulations. If substantive changes are made, the modified text will be made available for comment for at least 15 days prior to adoption, and sent to all persons who testified at the public hearing; all persons who submitted written comments at the public hearing; all persons whose comments were received by the SWRCB during the public comment period; and all persons who requested notification from the SWRCB of the availability of such changes.

CONTACT PERSON

This Notice of Proposed Rulemaking, the Initial Statement of Reasons, and the full text of the proposed regulations may also be viewed at the SWRCB Underground Storage Tank Program website at: **http://www.swrcb.ca.gov/~cwphome/ust/usthmpg.htm**

Please direct all written comments, procedural inquiries, and technical questions to:

Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
2014 "T" Street,
P.O. Box 944212
Sacramento, CA 94244-2120.

(916) 227-4377

STATE WATER RESOURCES CONTROL BOARD --
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

NON-CONTROLLING PLAIN ENGLISH SUMMARY

Underground storage tanks (USTs) are containers placed beneath the ground surface which store hazardous substances such as motor vehicle fuel, or solvents (chemicals commonly used for de-greasing operations and dry-cleaning). In California, the laws (also called statutes) that control UST construction and monitoring (for potential UST leaks) are incorporated into Chapter 6.7 of the California Health and Safety Code (HSC). The regulations which expand on, and make specific, these statutes are incorporated into Title 23, division 3, Chapter 16, of the California Code of Regulations (23 CCR).

The California legislature adopted Chapter 6.7 of the HSC in 1984 and has since changed Chapter 6.7 in response to either new federal statutes relating to underground storage tanks, or new information regarding updated business practices and/or the performance of USTs meeting then current regulatory requirements. In October 1999, the legislature again changed Chapter 6.7 by enacting Senate Bill 989, which essentially puts into law a recent executive order by the Governor. This executive order was the Governor's response to a University of California report on the environmental impacts of Methyl Tertiary Butyl Ether (MTBE) -- an additive put into motor vehicle fuel beginning in the late 1980's, early 90's to make motor vehicle fuel burn cleaner and thus reduce air pollution. The executive order requires the phase-out of MTBE in fuel by December 31, 2002.

The University report concluded that, "while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water." Since current underground storage tank laws and regulations were adopted without this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with stricter construction and monitoring standards for underground storage tanks.

The proposed regulations, where necessary, implement, interpret, and make specific these newly adopted statutes. The proposed regulations will do the following:

1. Require UST owners or operators to conduct testing of secondary containment systems (i.e. the second wall in a double-walled UST or UST piping) every three years. Current regulations only require this testing at the time the UST or piping is installed;

2. Require UST owners or operators of UST systems, which have a single-walled component and are located within 1,000 feet of a public drinking water well, to conduct enhanced leak detection every three years. Enhanced leak detection is UST leak detection that is in addition to current UST leak detection requirements. The proposed regulations require that this enhanced leak detection be a test method that evaluates the

structural worthiness of an underground tank system by putting a substance in the tank that is not part of the fuel, and checking for it outside the tank;

3. Require all UST owners and operators, including those who own or operate single-walled UST systems, to install under-dispenser containment by December 31, 2003. Some UST systems must have the under-dispenser containment installed prior to that date. Under-dispenser containment is a means by which to stop leaks that occur at the dispenser from entering the ground and eventually the ground water;

4. Require persons who conduct UST monitoring equipment annual maintenance certification to have a California contractors license, and be certified, and re-certified (every three years), by the manufacturer of the monitoring equipment being tested. Currently there are no training or licensing requirements for persons who conduct yearly inspections and maintenance of UST monitoring systems; and,

5. Require UST installers to be re-certified every three years by the manufacturer of the tank system being installed. Currently, installers only have to have this training one time.

IV. STATEMENT OF MAILING

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
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STATEMENT OF MAILING NOTICE
(Pursuant to Section 86 of Title 1 of the California Code of Regulations)

The State Water Resources Control Board (SWRCB) has complied with the provisions of Government Code section 11346.4, subdivisions (a)(1) through (4), regarding the mailing of the Notice of Proposed Regulatory Action. The Notice was mailed on **May 12, 2000**, 66 days prior to the end of the comment period which is scheduled for **July 18, 2000**.

Dated: May 12, 2000

By: Chas McSmith

Title: Assoc. Engineering Geologist

V. TEXT OF REGULATIONS (as originally proposed)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

TEXT OF REGULATIONS

***Amend Title 23, Division 3, Chapter 16, Article 1, section 2611 of the California Code of Regulations to read as follows*:**

2611. Additional Definitions

Unless the context requires otherwise, the following definitions shall apply to terms used in this chapter.

"Bladder system" means a flexible or rigid material which provides primary containment including an interstitial monitoring system designed to be installed inside an existing underground storage tank.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. The term includes only persons who have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"Coatings expert" means a person who, by reason of thorough training, knowledge, and experience in the coating of metal surfaces, is qualified to engage in the practice of internal tank lining inspections. The term includes only those persons who are independent of any lining manufacturer or applicator and have no financial interest in the tank or tanks being monitored.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which hazardous substances flow. For the purpose of determining how much piping is connected to any individual underground storage tank system, the piping that joins two underground storage tank systems should be allocated equally between them.

"Continuous monitoring" means a system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

"Dispenser" means an aboveground or underground device connected to underground storage tank piping that is used for the delivery of a hazardous substance from the underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

"Heating oil tank" means a tank located on a farm or at a personal residence and which holds no more than 1,100 gallons of home heating oil which is used consumptively at the premises where the tank is located.

"Holiday," when used with respect to underground storage tank coating or cladding, means a pinhole or void in a protective coating or cladding.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Inconclusive" means the conclusion of a statistical inventory reconciliation report that is not decisive as to whether a release has been detected.

"Independent testing organization" means an organization which tests products or systems for compliance with voluntary consensus standards. To be acceptable as an independent testing organization, the organization shall not be owned or controlled by any client, industrial organization, or any other person or institution with a financial interest in the product or system being tested. For an organization to certify, list, or label products or systems in compliance with voluntary consensus standards, it shall maintain formal periodic inspections of production of products or systems to ensure that a listed, certified, or labeled product or system continues to meet the appropriate standards.

"Independent third party" means independent testing organizations, consulting firms, test laboratories, not-for-profit research organizations and educational institutions with no financial interest in the matters under consideration. The term includes only those organizations which are not owned or controlled by any client, industrial organization, or any other institution with a financial interest in the matter under consideration.

"Integral secondary containment" means a secondary containment system manufactured as part of the underground storage tank.

"Interstitial space" means the space between the primary and secondary containment systems.

"Leak threshold" means the value against which test measurements are compared and which serves as the basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate.

"Liquid asphalt tank" means an underground storage tank which contains steam-refined asphalts.

"Liquefied petroleum gas tank" means an underground storage tank which contains normal butane, isobutane, propane, or butylene (including isomers) or mixtures composed predominantly thereof in a liquid or gaseous state having a vapor pressure in excess of 40 pounds per square inch absolute at a temperature of 100 degrees Fahrenheit.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing hazardous substances.

"Manufacturer" means any business which produces any item discussed in these regulations.

"Manual inventory reconciliation" means a procedure for determining whether an underground tank system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. This term does not include procedures which are based on statistical inventory reconciliation.

"Membrane liner" means any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored.

"Membrane liner fabricator" means any company which converts a membrane liner into a system for secondary containment.

"Membrane manufacturer" means any company which processes the constituent polymers into membrane sheeting from which the membrane liner is fabricated into a system for secondary containment.

"Motor vehicle" means a self-propelled device by which any person or property may be propelled, moved, or drawn.

"Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil.

"New underground storage tank" means an underground storage tank which is not an existing underground storage tank.

"Non-volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and consideration of circumstances and physical phenomena internal or external to the tank.

"Operational life" means the period beginning when installation of the tank system has begun until the time the tank system should be properly closed.

"Operator" means any person in control of, or having responsibility for, the daily operation of an underground storage tank system.

"Person", as defined in Chapter 6.7 of Division 20 of the Health and Safety Code includes any entity defined as a person under the Federal Act.

"Perennial ground water" means ground water that is present throughout the year.

"Petroleum" means petroleum including crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.

"Pipeline leak detector" means a continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less.

"Probability of detection" means the likelihood, expressed as a percentage, that a test method will correctly identify a leaking underground storage tank.

"Probability of false alarm" means the likelihood, expressed as a percentage, that a test method will incorrectly identify a "tight" tank as a leaking underground storage tank.

"Qualitative release detection method" means a method which detects the presence of a hazardous substance or suitable tracer outside the underground storage tank being tested.

"Quantitative release detection method" means a method which determines the integrity of an underground storage tank by measuring a release rate or by determining if a release exceeds a specific rate.

"Release detection method or system" means a method or system used to determine whether a release of a hazardous substance has occurred from an underground tank system into the environment or into the interstitial space between an underground tank system and its secondary containment.

"Repair" means to restore a tank or underground storage tank system component that has caused a release of a hazardous substance from the underground storage tank system.

"Septic tank" means a tank designed and used to receive and process biological waste and sewage.

"Spill containment or control system" means a device that is capable of preventing an unauthorized release from the dispenser from entering the soil or groundwater or both.

"Statistical inventory reconciliation" means a procedure to determine whether a tank is leaking based on the statistical analysis of measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically.

"Statistical inventory reconciliation provider" means the developer of a statistical inventory reconciliation method that meets federal and state standards as evidenced by a third-party evaluation conducted according to section 2643(f), or an entity that has been trained and certified by the developer of the method to be used. In either case, the provider shall have no direct or indirect financial interest in the underground storage tank being monitored.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Substantially beneath the surface of the ground" means that at least 10 percent of the underground tank system volume, including the volume of any connected piping, is below the ground surface or enclosed below earthen materials.

"Sump," "pit," "pond," or "lagoon" means a depression in the ground which lacks independent structural integrity and depends on surrounding earthen material for structural support of fluid containment.

"Tank integrity test" means a test method that can ascertain the physical integrity of an underground storage tank. The term includes only test methods which are able to detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of 5 percent or less. The test method may be either volumetric or non-volumetric in nature. A leak rate is reported using a volumetric test method, whereas, a non-volumetric test method reports whether a substance or physical phenomenon is detected which may indicate the presence of a leak.

"Unauthorized release" as defined in Chapter 6.7 of Division 20 of the Health and Safety Code does not include intentional withdrawals of hazardous substances for the purpose of legitimate sale, use, or disposal.

"Under-Dispenser Containment" means secondary containment that is located under a dispenser.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of hazardous substances.

"Upgrade compliance certificate" includes a numbered decal, file copy of the decal, and plastic fill pipe tag as described in Section 2712.1 of these regulations.

"Volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and comparison of tank volume.

"Voluntary consensus standards" means standards that shall be developed after all persons with a direct and material interest have had a right to express a viewpoint and, if dissatisfied, to appeal at any point (a partial list of the organizations that adopt voluntary consensus standards are shown in Appendix I, Table B).

"Wastewater treatment tank" means a tank designed to treat influent wastewater through physical, chemical, or biological methods and which is located inside a public or private wastewater treatment facility. The term includes untreated wastewater holding tanks, oil water separators, clarifiers, sludge holding tanks, filtration tanks, and clarified water tanks that do not continuously contain hazardous substances.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25282, 25283, 25284, **25284.1**, 25292.3 and 25299.5(a), Health and Safety Code; 40 CFR 280.10 and 280.12.

Amend Title 23, Division 3, Chapter 16, Article 3, existing sections 2630, 2631, 2635, and 2636 of the California Code of Regulations to read as follows:

2630. General Applicability of Article

(a) The requirements in this article apply to owners of new underground storage tanks. ~~**Underground storage tanks installed after January 1, 1984, may be deemed to be in compliance with the requirements in this article if they were installed in accordance with federal and state requirements that existed at the time of installation. However**~~ **In addition**, the applicable repair and upgrade requirements in Article 6 shall be complied with.

(b) Sections 2631 and 2632 specify design, construction, and monitoring requirements for all new underground storage tanks. **Sections 2633 and 2634 specify alternate design, construction, and monitoring requirements, in lieu of those specified in sections 2631 and 2632, for underground storage tanks installed before January 1, 1997 which store only motor vehicle fuel.** ~~**New**~~ **Uunderground storage tanks** ~~**which store only motor vehicle fuels may be**~~ **constructed** ~~**and monitored**~~ **pursuant to the requirements specified in sections 2633** ~~**and 2634**~~ **in lieu of those specified in sections 2631** ~~**and 2632. However, if the tank is constructed according to requirements in section 2633 the monitoring requirements of section 2634 shall also be met.**~~ **shall be monitored in accordance with section 2634.**

(c) All new underground storage tanks, piping, and secondary containment systems shall comply with sections 2635 and 2636.

(d) All monitoring equipment used to satisfy the requirements of **this article** ~~**sections 2632, 2634, and 2636**~~ shall be installed, calibrated, operated, and maintained in accordance with **section 2637(b).** ~~**manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.**~~

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1,** 25291 and 25292.3, Health and Safety Code; 40 CFR 280.20.

2631. Design and Construction Requirements for New Underground Storage Tanks

(a) All new underground storage tanks including associated piping used for the storage of hazardous substances shall have primary and secondary of containment. Primary containment shall be product-tight. Secondary containment may be manufactured as an integral part of the primary containment or it may be constructed as a separate containment system. **Secondary containment systems shall be designed and constructed such that the secondary containment system can be periodically tested in accordance with section 2637(a).**

(b) The design and construction of all primary containment including any integral secondary containment system, shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. All other components used to construct the primary containment system, such as special accessories, fittings, coatings or linings, monitoring systems and level controls used to form the underground storage tank system shall also be approved by an independent testing organization. This requirement became effective on July 1, 1991 for underground storage tanks; January 1, 1992 for piping; and shall be effective on January 1, 1995 for all other components. The exterior surface of underground storage tanks shall bear a marking, code stamp, or label showing the following minimum information:

(1) Engineering standard used;
(2) Nominal diameter in feet;
(3) Nominal capacity in gallons;
(4) Degree of secondary containment;
(5) Useable capacity in gallons;
(6) Design pressure in psig;
(7) Maximum operating temperature in degrees Fahrenheit;
(8) Construction materials;
(9) Year manufactured; and
(10) Identity of manufacturer.

(c) A primary containment system with or without an integral secondary containment system shall have wear plates (striker plates) installed, center to center, below all accessible openings. The plates shall be made of steel or other appropriate material if steel is not compatible with the hazardous substance stored. The width of the plate shall be at least eight inches on each side, or shall be equal to the area of the accessible opening or guide tube, whichever is larger. The thickness of the steel plate shall be at least 1/8 inch and those made of other materials shall be of sufficient thickness to provide equivalent protection. The plate, if under 1/4 inch thick, shall be rolled to the contours of the underground storage tank and all plates shall be bonded or tack welded in place. A drop tube-mounted bottom protector may fulfill this requirement.

(d) A secondary containment system which is not an integral part of primary containment shall be designed and constructed according to an engineering specification approved by a state registered professional engineer or according to a nationally recognized industry code or engineering standard. The engineering specification shall include the construction procedures. Materials used to construct the secondary containment system shall have sufficient thickness, density, and corrosion resistance to prevent structural weakening or damage to the secondary containment system as a result of contact with any released hazardous substance. The following requirements apply to these secondary containment systems:

(1) The secondary containment system shall be constructed to contain at least the following volumes:

(A) One hundred percent of the usable capacity of the primary containment system where only one primary container is within the secondary containment system.

(B) In the case of multiple primary containers within a single secondary containment system, the secondary containment system shall be large enough to contain 150 percent of the volume of the largest primary container within it, or 10 percent of the aggregate internal volume of all primary containers within the secondary containment system, whichever is greater. When all primary containers are completely enclosed within the secondary containment system, the restrictions of this subsection do not apply.

(2) If the secondary containment system is open to rainfall, it shall be constructed to accommodate the volume of precipitation which could enter the secondary containment system during a 24-hour, 25-year storm in addition to the volume specified in subsection (d)(1).

(3) If backfill material is placed in the secondary containment system, the volumetric requirements for the pore space shall be equal to the requirement in subsection (d)(1). The available pore space in the secondary containment system backfill shall be determined using standard engineering methods and safety factors. The specific retention and specific yield of the backfill material, the location of any primary container within the secondary containment, and the proposed method of operation for the secondary containment system shall be considered in determining the available pore space.

(4) The secondary containment system shall be equipped with a collection system to accumulate, temporarily store, and permit removal of any liquid within the system.

(5) The floor of the secondary containment system shall be constructed on a firm base and, if necessary for monitoring, shall be sloped to a collection sump. One or more access casings shall be installed in the sump and sized to allow removal of collected liquid. The access casing shall extend to the ground surface, be perforated in the region of the sump, and be covered with a locked waterproof cap or enclosed in a surface security structure that will protect the access casing(s) from entry of surface water, accidental damage, unauthorized access, and vandalism. A facility with locked gates will satisfy the requirements for protection against unauthorized access and vandalism. The casing shall have sufficient thickness to withstand all anticipated stresses with appropriate engineering safety factors and constructed of materials that will not be structurally weakened by the stored hazardous substance and will not donate, capture, or mask constituents for which analyses will be made.

(6) Secondary containment systems utilizing using membrane liners shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. A membrane liner shall contain no primary nutrients or food-like substances attractive to rodents and shall meet the requirements in Table 3.1 after a 30-day immersion in the stored hazardous substance.

(7) A membrane liner, if used, shall be installed under the direct supervision of a representative of the membrane liner fabricator or a contractor certified by the fabricator.

(8) The excavation base and walls for a membrane liner shall be prepared to the membrane liner fabricator's specifications and shall be firm, smooth, and free of any sharp objects or protrusions.

(9) The site shall be assessed to ensure that the secondary containment is always above the ground water and not in a 25-year flood plain, unless the containment and monitoring designs are for use under such conditions.

(e) Laminated, coated, or clad materials shall be considered a single wall and do not fulfill the requirements of both primary and secondary containment.

(f) Underground storage tanks with integral secondary containment systems, which satisfy the construction requirements of subsection (b), fulfill the volumetric requirements for secondary containment specified in subsection (d)(1).

(g) Underground storage tanks with secondary containment systems shall be designed and installed so that any loss of a hazardous substance from the primary containment will be detected by an interstitial monitoring device or method.

(h) An underground storage tank which contains motor vehicle fuel and which is designed with an integral secondary containment system shall provide 100 percent secondary containment unless it is equipped with the overfill prevention system in accordance with section 2635(b)(2)(C). In this case, the top portion of the tank, no greater than two feet wide along the length of the tank, may be single-walled.

(i) Tanks designed and constructed pursuant to the provisions of this section shall be monitored according to the provisions of section 2632.

Authority cited: Sections 25299.3 and 25299.7 Health and Safety Code.
Reference: Sections 25281, **25284.1** and 25291, Health and Safety Code; 40 CFR 280.20.

2635. Installation and Testing Requirements for All New Underground Storage Tanks

(a) Primary and secondary containment systems shall be designed, constructed, tested, and certified to comply, as applicable, with all of the following requirements:

(1) All underground storage tanks shall be tested at the factory before being transported. The tests shall determine whether the tanks were constructed in accordance with the applicable sections of the industry code or engineering standard under which they were built.

(2) The outer surface of underground storage tanks constructed of steel shall be protected from corrosion as follows, except that primary containment systems installed in a secondary containment system and not backfilled do not need cathodic protection:

(A) Field-installed cathodic protection systems shall be designed and certified as adequate by a corrosion specialist. The cathodic protection systems shall be tested by a cathodic protection tester within six months of installation and at least every three years thereafter. The criteria that are used to determine that cathodic protection is adequate as required by this section shall be in accordance with a code of practice developed in accordance with voluntary consensus standards. Impressed-current cathodic protection systems shall also be inspected no less than every 60 calendar days to ensure that they are in proper working order.

(B) Underground storage tanks protected with fiberglass-reinforced plastic coatings, composites, or equivalent non-metallic exterior coatings or coverings, including coating/sacrificial anode systems, shall be tested at the installation site using an electric resistance holiday detector. All holidays detected shall be repaired and checked by a factory authorized repair service before installation. During and after installation, care shall be taken to prevent damage to the protective coating or cladding. Preengineered corrosion protection systems with sacrificial anodes shall be checked once every three years in accordance with the manufacturer's instructions.

(3) Before installation, the tank shall be tested for tightness at the installation site in accordance with the manufacturer's written guidelines. If there are no guidelines, the primary and secondary containment shall be tested for tightness with air pressure at not less than 3 pounds per square-inch (20.68 k Pa) and not more than 5 pounds per square-inch (34.48 k Pa). In lieu of the above, an equivalent differential pressure test, expressed in inches of mercury vacuum, in the interstitial space of the secondary containment, is acceptable. The pressure (or vacuum in the interstitial space) shall be maintained for a minimum of 30 minutes to determine if the tank is tight. If a tank fails the tightness test, as evidenced by soap bubbles, or water droplets, installation shall be suspended until the tank is replaced or repaired by a factory authorized repair service. Following repair or replacement, the tank shall pass a tightness test.

(4) All secondary containment systems shall pass a post-installation test which meets the approval of the local agency.

(5) After installation, but before the underground storage tank is placed in service, a tank integrity test shall be conducted to ensure that no damage occurred during installation. The tank integrity test is not required if the tank is equipped with an interstitial monitor certified by a third-party evaluator to meet the performance standards of a "tank integrity test" as defined in section 2611, or if the tank is tested using another method deemed by the State Water Resources Control Board to be equivalent.

(6) All underground storage tanks shall be installed according to a code of practice developed in accordance with voluntary consensus standards and the manufacturer's written installation instructions. The owner or operator

shall certify that the underground storage tank was installed in accordance with the above requirements as required by subsection (d) of this section.

(7) All underground storage tanks subject to flotation shall be anchored using methods specified by the manufacturer or, if none exist, shall be anchored according to the best engineering judgment.

(b) All underground storage tanks shall be equipped with a spill container and an overfill prevention system as follows:

(1) The spill container shall collect any hazardous substances spilled during product delivery operations to prevent the hazardous substance from entering the subsurface environment. The spill container shall meet the following requirements:

(A) If it is made of metal, the exterior wall shall be protected from galvanic corrosion.
(B) It shall have a minimum capacity of five gallons (19 liters).
(C) It shall have a drain valve which allows drainage of the collected spill into the primary container or provide a means to keep the spill container empty.

(2) The overfill prevention system shall not allow for manual override and shall meet one of the following requirements:

(A) Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or

(B) Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm sounds at least five minutes before the tank overfills; or

(C) Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or,

(D) Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

(3) The local agency may waive the requirement for overfill prevention equipment where the tank inlet exists in an observable area, the spill container is adequate to collect any overfill, and the tank system is filled by transfers of no more than 25 gallons at one time.

(c) Secondary containment systems including leak interception and detection systems installed pursuant to section 2633 shall comply with all of the following:

(1) The secondary containment system shall encompass the area within the system of vertical planes surrounding the exterior of the primary containment system. If backfill is placed between the primary and secondary containment systems, an evaluation shall be made of the maximum lateral spread of a point leak from the primary containment system over the vertical distance between the primary and secondary containment systems. The secondary containment system shall extend an additional distance beyond the vertical planes described above equal to the radius of the lateral spread plus one foot.

(2) The secondary containment system shall be capable of preventing the inflow of the highest ground water anticipated into the interstitial space during the life of the tank.

(3) If the interstitial space is backfilled, the backfill material shall not prevent the vertical movement of leakage from any part of the primary containment system.

(4) The secondary containment system with backfill material shall be designed and constructed to promote gravity drainage of an unauthorized release of hazardous substances from any part of the primary containment system to the monitoring location(s).

(5) Two or more primary containment systems shall not use the same secondary containment system if the primary containment systems store materials that in combination may cause a fire or explosion, or the production of a flammable, toxic, or poisonous gas, or the deterioration of any part of the primary or secondary containment system.

(6) Drainage of liquid from within a secondary containment system shall be controlled in a manner approved by the local agency to prevent hazardous materials from being discharged into the environment. The liquid shall be analyzed to determine the presence of any of the hazardous substance(s) stored in the primary containment system prior to initial removal, and monthly thereafter, for any continuous discharge (removal) to determine the appropriate method for final disposal. The liquid shall be sampled and analyzed immediately upon any indication of an unauthorized release from the primary containment system.

(7) For primary containment systems installed completely beneath the ground surface, the original excavation for the secondary containment system shall have a water-tight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as water-tight as practical. Primary containment systems with integral secondary containment and open vaults are exempt from the requirements of this subsection.

(8) The actual location and orientation of the tanks and appurtenant piping systems shall be indicated on as-built drawings of the facility. Copies of all drawings, photographs, and plans shall be submitted to the local agency for approval.

(d) Owners or their agents shall certify that the installation of the tanks and piping meets the conditions in subdivisions (1) through (5) below. The certification shall be made on a "Certificate of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(1) The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers~~;~~**. <u>This certification must be renewed every 36 months upon completion of refresher training provided by the manufacturer</u>.**

(2) The installer has been certified or licensed by the Contractors State License Board;

(3) The underground storage tank, any primary piping, and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions;

(4) All work listed in the manufacturer's installation checklist has been completed; and

(5) The installation has been inspected and approved by the local agency, or, if required by the local agency, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **<u>25284.1, 25291</u>** and 25299, Health and Safety Code; 40 CFR 280.40 - 280.45.

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping **<u>and Under-dispenser Containment.</u>**

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems shall be sloped so that all releases will flow to a collection sump located at the low point of the underground piping.

(2) Primary piping and secondary containment systems shall be installed in accordance with an industry code of practice developed in accordance with voluntary consensus standards. The owner or operator shall certify that the piping was installed in accordance with the above requirements of section 2635(d). The certification shall be made on the "Certification of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(d) Lined trench systems used as part of a secondary containment system shall be designed and constructed according to a code of practice or engineering standard approved by a state registered professional engineer. The following requirements shall also apply:

(1) All trench materials shall be compatible with the substance stored and evaluated by an independent testing organization for their compatibility or adequacy of the trench design, construction, and application.

(2) The trench shall be covered and capable of supporting any expected vehicular traffic.

(e) All new primary piping and secondary containment systems shall be tested for tightness after installation in accordance with manufacturer's guidelines. Primary pressurized piping shall be tested for tightness hydrostatically at 150 percent of design operating pressure or pneumatically at 110 percent of design operating pressure. If the calculated test pressure for pressurized piping is less than 40 psi, 40 psi shall be used as the test pressure. The pressure shall be maintained for a minimum of 30 minutes and all joints shall be soap tested. A failed test, as evidenced by the presence of bubbles, shall require appropriate repairs and retesting. If there are no manufacturer's guidelines, secondary containment systems shall be tested using an applicable method specified in an industry code or engineering standard. Suction piping and gravity flow piping which cannot be isolated from the tank shall be tested after installation in conjunction with an overfilled volumetric tank integrity test, or other test method meeting the requirements of section 2643(f), if approved by the local agency.

(f) Underground piping with secondary containment shall be equipped and monitored as follows:

(1) The secondary containment system shall be equipped with a continuous monitoring system which meets the requirements of section 2643(f) and which is connected to an audible and visual alarm system.

(2) Automatic line leak detectors shall be installed on underground pressurized piping and shall be capable of detecting a 3-gallon per hour leak rate at 10 psi within 1 hour with a probability of detection of at least 95 percent and a probability of false alarm no greater than 5 percent. Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section. A continuous monitoring system as described in subdivision (1), which shuts down the pump in addition to activating the alarm system, satisfies the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure of the product piping system at the test pressure with at least a 95 percent

probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) The secondary containment system is equipped with a continuous monitoring system. The leak detection device may be located at the pump sump if the piping slopes back to this point.

(2) A continuous monitoring system is connected to an audible and visual alarm system and the pumping system.

(3) A continuous monitor shuts down the pump and activates the alarm system when a release is detected.

(4) The pumping system shuts down automatically if the continuous monitoring system fails or is disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:

(1) Owners or Operators of a UST system shall have the system fitted with under-dispenser containment, or an approved dispenser spill containment or control system according to the following schedule:

(A) At the time of installation for systems installed after January 1, 2000.

(B) By July 1, 2001, for systems installed after July 1, 1987 that are located within 1,000 feet of a public drinking water well, as notified by the board according to its Geographic Information System mapping database.

(C) By December 31, 2003, for systems not subject to subsection 2636(h)(1)(A) or (B).

(2) Under-dispenser containment must be designed, constructed, installed, and monitored in accordance with section 2631, 2636(c)(2), 2636(e), and 2636(f)(1). Separate monitoring for under-dispenser containment is not required if the lowest point of the under-dispenser containment drains to a monitoring point within the connected piping system.

(3) A manufacturer of a dispenser spill containment or control system may apply to the Division of Clean Water Programs Underground Storage Tank Program Manager for approval of the system. Owners or operators shall not install a dispenser spill containment or control system that has not been approved.

(A) Applications for approval shall be submitted in writing and include the following:

(i) A description of the proposed system.

(ii) Clear and convincing evidence that the system will protect the soil and beneficial uses of the waters of the state from unauthorized releases.

(B) The Program Manager shall review the application to determine if the proposed system adequately protects the soil and beneficial uses of groundwater before determining whether to approve the proposed system.

(C) The Program Manager may modify or revoke a previously issued approval if it finds that, based on new evidence, the approved system does not adequately protect the soil and beneficial uses of groundwater from unauthorized releases.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1**, 25291 and 25299, Health and Safety Code; 40 CFR 280.20, 280.40-280.45.

Amend Title 23, Division 3, Chapter 16, Article 3, to add new sections 2636.1, 2636.2, 2636.3, 2636.4 and 2637 of the California Code of Regulations as follows:

2636.1. Final Division Decisions Regarding Spill Containment or Control Systems

(a) A manufacturer of a dispenser spill containment or control system who disagrees with a determination by the Program Manager not to approve the manufacturer's system under section 2636(h)(3)(B) or to modify or revoke a previously issued approval of the manufacturer's system under section 2636(h)(3)(C) may ask for a review by the Division Chief.

(b) An appeal to the Division Chief must be in writing and must be accompanied by all material that the manufacturer wishes to be considered by the Division Chief, and by the Board in any subsequent review by the Board. The appeal must contain an explanation why the manufacturer believes the Program Manager's determination is erroneous, inappropriate, or improper.

(c) The Division Chief shall render a Final Division Decision within 30 days of receipt of the appeal. A Final Division Decision is final and conclusive unless the manufacturer files a petition for review with the Board that is received by the Board within 30 days from the date of the Final Division Decision.

(d) The Division Chief may at any time, on the Division Chief's own motion, issue a Final Division Decision.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.2. Petition for Board Review Regarding Spill Containment or Control Systems

(a) A manufacturer may petition the Board for review of a Final Division Decision.

(b) A petition for Board review shall contain the following:

(1) The name and address of the petitioner;

(2) A statement of the date on which the petitioner received the Division's final decision;

(3) A copy of the Final Division Decision that the Board is requested to review;

(4) An explanation why the petitioner believes the Final Division Decision is erroneous, inappropriate, or improper;

(5) A statement describing how the petitioner is damaged by the Final Division Decision; and

(6) A description of the remedy or outcome desired.

(c) The petition shall be sent to the Board Chairperson, with copies sent to the Chief Counsel of the Board, and the Division Chief.

(d) The petitioner may request a hearing for the purpose of presenting factual material not presented to the Division Chief or for oral argument or both. The request to present material that was not presented to the Division Chief must include a description of the factual material that the petitioner wishes to submit, the facts that the petitioner expects to establish, and an explanation of the reasons why the petitioner could not previously submit the new material to the Division Chief. The petitioner must include with the petition a copy of any new documentary material that the petitioner wishes to present to the Board.

(e) The Division Chief may file a response to the petition with the Board within 30 days of the Board's notification to the petitioner that the petition is complete. The

Division must provide a copy of any response to the petitioner. The Board may extend the time for filing a response by the Division Chief.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.3. Defective Petitions

Upon the Board's receipt of a petition which does not comply with section 2636.2 of this chapter, the Board, through its Chief Counsel, will advise the petitioner of the manner in which the petition is defective and allow a reasonable time within which an amended petition may be filed. If the Board does not receive a properly amended petition within the time allowed, the petition shall be dismissed.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.4. Action by the Board Regarding Spill Containment or Control Systems

(a) In response to the petition, the Board may:

(1) Refuse to review the petition if it is late or fails to raise substantial issues that are appropriate for Board review;

(2) Affirm the final decision that the Board has been requested to review;

(3) Set aside or modify the final decision that the Board has been requested to review; or

(4) Take such other action as the Board deems appropriate.

(b) Before taking action, the Board may, at its discretion, hold a hearing, or provide for an informal meeting between the petitioner, the Division Chief, a member of the Board, and such other persons as the Board deems appropriate for the purpose of attempting to resolve the dispute.

(c) If an evidentiary hearing is held, it shall be conducted in accordance with the California Code of Regulations, title 23, division 3, Chapter 1.5, article 2.

(d) The Board reserves the right, at its discretion, to consider a petition upon its own motion.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2637. Secondary Containment Testing and Annual Maintenance Certification

(a) On or after January 1, 2001 all secondary containment of underground storage tank systems, including, but not limited to, open secondary containment, lined trench systems, under-dispenser containment, and sumps, shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002 and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) The owner or operator of any secondary containment system that cannot be tested in accordance with this section shall, in accordance with subsections 2644.1(a)(1), (2), (4), and (5), submit a proposed program of enhanced leak detection to the local agency by October 1, 2001. The local agency shall review the proposed program of enhanced leak detection within 30 days of submittal or re-submittal. After approval by the local agency, the owner or operator shall implement the program no later than January 1, 2002. Additionally, the owner or operator shall replace this secondary containment with a system that can be tested in accordance with this section on or before July 1, 2005.

(2) Secondary containment systems must be tested in accordance with manufacturer's guidelines and standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002, annual certification of monitoring equipment shall be conducted as follows:

(1) A person performing the annual monitoring equipment certification shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer upon completion of a manufacturer's refresher course every 36 months.

(2) The monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

(3) UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

(4) The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency.

(5) ~~A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.~~

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

(2) Any period during which hazardous substances are stored in the tank, and no filling or withdrawal is conducted; and

(3) Any period between cessation of the storage of hazardous substances and the actual completion of closure, pursuant to Article 7, unless otherwise specified by the local agency, pursuant to section 2671(b), during a temporary closure period.

(c) This article shall not apply to underground storage tanks that are designed, constructed, installed, and monitored in accordance with ~~**sections 2631 and 2632 or 2633 and 2634 of**~~ Article 3.

(d) Owners or operators of tanks monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code shall comply with the requirements of section 2645. Tank systems having a capacity of more than 2,000 gallons shall not be monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code.

(e) **An owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well , as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1. Additionally, the following conditions for enhanced leak detection shall apply:**

(1) **For the purpose of section 2644.1, vent or tank riser piping, vapor recovery piping, and suction piping that meet the definitions of section 2636(a)(1), (2), or (3), are not considered single-walled components.**

(2) Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 90 calendar days of the date of the notification. The Program Manager shall make a decision on the request within 30 calendar days of receipt of the request.

(3) **The request for reconsideration must include the name and address of the subject facility, the name and address of the owner or operator submitting the request, and the reason(s) why the requester believes the board notification was in error. If the request is based on a belief that the UST system in question is greater than 1,000 feet from a public drinking water well, the request shall include a scaled map showing the location of the subject UST system and the location of the nearest public drinking water well. If the request is based on a determination that the subject UST system does not have a single-walled component, the request shall include supporting documentation. A copy of the request shall be concurrently submitted to the local agency.**

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25292 and **25292.4,** Health and Safety Code; 40 CFR 280.40, 280.42 and 280.43(b).

2641. Monitoring Program Requirements

(a) Owners or operators of existing underground storage tanks subject to this article shall implement a monitoring program which is capable of detecting an unauthorized release from any portion of the underground storage tank system at the earliest possible opportunity.

(b) Underground piping shall be exempt from monitoring requirements if the local agency determines that the piping has been designed and constructed in accordance with section 2636(a)(3).

(c) All underground piping that operates at less than atmospheric pressure, unless it is exempt from monitoring under subsection (b), shall comply with the monitoring requirements of section 2643(d) and shall also include daily monitoring as described in Appendix II.

(d) All portions of the underground storage tank system shall be visually monitored in accordance with section 2642. A portion of the underground storage tank shall be exempt from visual monitoring if the owner demonstrates to the satisfaction of the local agency that one or more of the following conditions apply to that portion:

(1) It is not accessible for direct viewing;

(2) Visual inspection would be hazardous or would require the use of extraordinary personal protection equipment other than normal protective equipment such as steel-toed shoes, hard hat, or ear protection; or

(3) The underground storage tank is located at a facility which is not staffed on a daily basis.

(e) Non-visual monitoring shall be implemented for all portions of the underground storage tank which are exempt under subsection (d) and, for the underground storage tank, during periods when visual monitoring required under subsection (d) is not conducted. This non-visual monitoring shall include a quantitative release detection method as specified in section 2643 or a qualitative release detection method as specified in section 2644 or a combination of these methods as approved by the local agency.

(f) Non-visual monitoring for underground pressurized piping shall include a quantitative release detection method that complies with the performance requirements in section 2643(c)(1).

(g) The monitoring program shall be approved by the local agency and shall be in compliance with the requirements of this article and with the underground storage tank operating permit. The local agency may require additional monitoring methods specified in the operating permit or more frequent monitoring as necessary to satisfy the objective in subsection (a). In deciding whether to approve a proposed monitoring program, or to require additional methods or more frequent monitoring, the local agency shall consider the following factors:

(1) The volume and physical and chemical characteristics of the hazardous substance(s) stored in the underground storage tank;

(2) The compatibility of the stored hazardous substance(s) and any chemical-reaction product(s) with the function of monitoring equipment or devices;

(3) The reliability and consistency of the proposed monitoring equipment and systems under site-specific conditions;

(4) The depth and quantity of ground water and the direction of ground water flow;

(5) The patterns of precipitation in the region and any ground water recharge which occurs as a result of precipitation;

(6) The existing quality of ground water in the area, including other sources of contamination and their cumulative impacts;

(7) The current and potential future uses (e.g., domestic, municipal, agricultural, industrial supply) of ground water in the area;

(8) The proximity and withdrawal rates of ground water users in the area;

(9) The type, homogeneity, and range of moisture content of the backfill material and native soils and their probable effects on contaminant migration and detection;

(10) The presence of contamination in the excavation zone or surrounding soils;

(11) The proximity of the underground storage tank to surface waters; and

(12) Additional hydrogeologic characteristics of the zone surrounding the underground storage tank.

(h) The monitoring program shall include written monitoring procedures and a response plan as set forth in section 2632(d).

(i) If the local agency does not approve the monitoring program, the owner or operator shall replace, repair, upgrade, or close the tank in accordance with the applicable provisions of this chapter and local agency approval.

(j) Equipment and devices used to monitor underground storage tanks shall be installed, calibrated, operated, and maintained in accordance with **section 2637(b).** ~~manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.~~

(k) When an unauthorized release is indicated during the installation of a release detection system, the owner or operator shall comply with the release reporting requirements of Article 5 and, if the release came from the existing tank, shall cease the installation process until the tank system is replaced, repaired, upgraded, or closed in accordance with the applicable provisions of this chapter.

(l) When implementation of the monitoring program, or any condition, indicates that an unauthorized release may have occurred, the owner or operator shall comply with the release reporting requirements of Article 5 and shall replace, repair, or close the underground storage tank in accordance with the applicable provisions of this chapter.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25283, **25284.1**, 25291 and 25292 Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, to add new section 2644.1 of the California Code of Regulations as follows:

2644.1 Enhanced Leak Detection

(a) An owner or operator who is required, pursuant to section 2640(e), to implement a program of enhanced leak detection or monitoring shall comply with the requirements of this section as follows:

(1) Enhanced leak detection means a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system.

(2) The enhanced leak detection test method shall be third party certified, in accordance with *section 2643(f), for the capability of detecting both vapor* and liquid phase releases from the underground storage tank system. The enhanced leak detection test method shall be capable of detecting a leak rate of at least 0.05 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.

(3) **<u>Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the local agency within 6 months following notification by the board. The enhanced leak detection shall be implemented no later than 12 months following receipt of notification from the board.</u>**

(4) **<u>Owners and operators of underground storage tanks subject to the requirements of this section must notify the local agency at least 48 hours prior to conducting the enhanced leak detection test unless this notification requirement is waived by the local agency.</u>**

(5) **<u>Owners and operators of underground storage tanks subject to the requirements of this section shall submit a copy of the enhanced leak detection test report to the board and the local agency within 60 days of completion of the test.</u>**

<u>Authority cited: Sections 25299.3, and 25299.7, Health and Safety Code.</u>
<u>Reference: Sections 25283, 25291, 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40 and 280.41.</u>

***Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows*:**

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping **<u>and dispensers.</u>**

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998**<u>. Upgrade requirements for dispensers shall be completed no later than December 31, 2003</u>**.

(i) As a preventive measure, an owner or operator may upgrade any underground storage tank constructed of any material which is not under pressure and which contains motor vehicle fuel as specified in sections 2662(a), (c), and (e). Before upgrading in accordance with this subsection, the owner or operator shall prove to the satisfaction of the local agency that the underground storage tank system has not caused an unauthorized release. If soil samples are taken, the owner or operator shall notify the local agency in advance of taking the samples.

(j) Owners or operators shall maintain records of repairs, linings, and upgrades that demonstrate compliance with the requirements of this article for the remaining operating life of the tank.

(k) Local agencies shall not approve a repair or upgrade unless it can be demonstrated that the underground storage tank system is structurally sound and the method of repair or upgrade will prevent unauthorized releases due to structural failure or corrosion during the operating life of the underground storage tank system.

(l) The materials used in the repair or upgrading process shall be applied in accordance with nationally recognized engineering practices.

(m) Materials used in repairs and upgrades shall be compatible with the existing underground storage tank system materials and shall not be subject to deterioration due to contact with the hazardous substance being stored.

(n) Steel underground storage tanks that exhibit external corrosion during the course of repair or upgrade shall comply with the cathodic protection requirements of section 2635(a)(2).

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections **<u>25284.1</u>**, 25292, 25292.1 and 25296, Health and Safety Code; 40 CFR 280.21, 280.33 and 281.32(d)

2666. Requirements for Upgrading Underground Piping <u>and Dispensers</u>

(a) By December 22, 1998, all underground piping containing hazardous substances other than motor vehicle fuel shall be retrofitted with secondary containment meeting the requirements of section 2636.

(b) By December 22, 1998, all underground piping containing motor vehicle fuel and connected to an existing tank shall be retrofitted with secondary containment unless the owner or operator demonstrates to the local agency that the piping is constructed of fiberglass reinforced plastic, cathodically protected steel, or other materials compatible with stored products and resistant to corrosion. The secondary containment system shall meet the construction, installation, and monitoring requirements of section 2636.

(c) By December 22, 1998, all automatic line leak detectors for underground pressurized piping which is not secondarily contained shall be capable of shutting off the pump when a release occurs. In addition, the pumping system shall shut down automatically if the automatic line leak detector fails or is disconnected. In lieu of the above, for underground storage tank emergency generator systems, the leak detector must be connected to an audible and visible alarm to indicate a release or malfunction of the system.

(d) All underground piping and secondary containment shall be tested for tightness after installation in accordance with section 2636(e).

(e) By December 31, 2003, all existing underground storage tanks shall be retrofitted with under-dispenser containment, or a dispenser spill containment or control system. The under-dispenser containment or dispenser spill containment or control system shall meet, where applicable, the requirements of *2636(h)(2), or 2636(h)(3).*

Authority cited : Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section **25284.1**, 25292 and 25292.1, Health and Safety Code; 40 CFR 280.21.

MONITORING SYSTEM CERTIFICATION

For Use By All Jurisdictions Within the State of California
Authority Cited: Chapter 6.7, Health and Safety Code; Chapter 16, Division 3, Title 23, California Code of Regulations

This form must be used to document testing and servicing of monitoring equipment. If more than one monitoring system control panel is installed at the facility, a separate certification or report must be prepared for each monitoring system control panel by the technician who performs the work. A copy of this form must be provided to the tank system owner/operator. The owner/operator must submit a copy of this form to the local agency regulating UST systems within 30 days of test date. Instructions are printed on the back of this page.

A. General Information

Facility Name: ______________________________ Bldg. No.: __________

Site Address: ______________________________ City: ______________ Zip: __________

Facility Contact Person: ______________________________ Contact Phone No.: (______) ______________

Make/Model of Monitoring System: ______________________________ Date of Testing/Servicing: ___/___/___

B. Inventory of Equipment Tested/Certified

Check the appropriate boxes to indicate specific equipment inspected/serviced:

Tank ID: ______________________	Tank ID: ______________________
☐ In-Tank Gauging Probe. Model: __________	☐ In-Tank Gauging Probe. Model: __________
☐ Annular Space or Vault Sensor. Model: __________	☐ Annular Space or Vault Sensor. Model: __________
☐ Piping Sump / Trench Sensor(s). Model: __________	☐ Piping Sump / Trench Sensor(s). Model: __________
☐ Fill Sump Sensor(s). Model: __________	☐ Fill Sump Sensor(s). Model: __________
☐ Mechanical Line Leak Detector. Model: __________	☐ Mechanical Line Leak Detector. Model: __________
☐ Electronic Line Leak Detector. Model: __________	☐ Electronic Line Leak Detector. Model: __________
☐ Tank Overfill / High-Level Sensor. Model: __________	☐ Tank Overfill / High-Level Sensor. Model: __________
☐ Dispenser Containment Sensor(s). Model: __________	☐ Dispenser Containment Sensor(s). Model: __________
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).
Tank ID: ______________________	Tank ID: ______________________
☐ In-Tank Gauging Probe. Model: __________	☐ In-Tank Gauging Probe. Model: __________
☐ Annular Space or Vault Sensor. Model: __________	☐ Annular Space or Vault Sensor. Model: __________
☐ Piping Sump / Trench Sensor(s). Model: __________	☐ Piping Sump / Trench Sensor(s). Model: __________
☐ Fill Sump Sensor(s). Model: __________	☐ Fill Sump Sensor(s). Model: __________
☐ Mechanical Line Leak Detector. Model: __________	☐ Mechanical Line Leak Detector. Model: __________
☐ Electronic Line Leak Detector. Model: __________	☐ Electronic Line Leak Detector. Model: __________
☐ Tank Overfill / High-Level Sensor. Model: __________	☐ Tank Overfill / High-Level Sensor. Model: __________
☐ Dispenser Containment Sensor(s). Model: __________	☐ Dispenser Containment Sensor(s). Model: __________
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).

C. Certification

- I certify that the equipment identified in this document was inspected/serviced in accordance with the manufacturers' guidelines. Attached to this Certification is information (e.g. manufacturers' checklists) necessary to verify that this information is correct and a Site Plan showing the layout of monitoring equipment. For any equipment capable of generating such reports, I have also attached a copy of the *(check all that apply)*: **☐ System set-up report; ☐ Alarm history report.**

Technician Name (print): ______________________ Cert./Lic. No.: __________ Signature: ______________________

Testing Company Name: ______________________________ Phone No.: (______) ______________

Monitoring System Certification

Site Address: ______________________________ Date of Testing/Servicing: ___/___/___

Results of Testing/Servicing

ware Version Installed: ____________________

Complete the following checklist:

❑ Yes	❑ No*	Is the audible alarm operational?
❑ Yes	❑ No*	Is the visual alarm operational?
❑ Yes	❑ No*	Were all sensors visually inspected, functionally tested, and confirmed operational?
❑ Yes	❑ No*	Were all sensors installed at lowest point of secondary containment and positioned so that other equipment will not interfere with their proper operation?
❑ Yes	❑ No* ❑ N/A	If alarms are relayed to a remote monitoring station, is all communications equipment (e.g. modem) operational?
❑ Yes	❑ No* ❑ N/A	For pressurized piping systems, does the turbine automatically shut down if the piping secondary containment monitoring system detects a leak, fails to operate, or is electrically disconnected? *If yes: which sensors initiate positive shut-down? (Check all that apply)* ❑ Sump/Trench Sensors; ❑ Dispenser Containment Sensors. Did you confirm positive shut-down due to leaks and sensor failure/disconnection? ❑ Yes; ❑ No.
❑ Yes	❑ No* ❑ N/A	For tank systems that utilize the monitoring system as the primary tank overfill warning device (i.e. no mechanical overfill prevention valve is installed), is the overfill warning alarm visible and audible at the tank fill point(s) and operating properly? If so, at what percent of tank capacity does the alarm trigger? _______%
❑ Yes*	❑ No	Was any monitoring equipment replaced? If yes, identify specific sensors, probes, or other equipment replaced *and list the manufacturer name and model for all replacement parts in Section E, below.*
❑ Yes*	❑ No	Was liquid found inside any secondary containment systems designed as dry systems? *(Check all that apply)* ❑ Product; ❑ Water. If yes, describe causes in Section E, below.
❑ Yes	❑ No*	Was monitoring system set-up reviewed to ensure proper settings? Attach set up reports, if applicable
❑ Yes	❑ No*	Is all monitoring equipment operational per manufacturer's specifications?

Section E below, describe how and when these deficiencies were or will be corrected.

E. Comments: ____________________

Site Address: ______________________________ Date of Testing/Servicing: ___/___/___

In-Tank Gauging / SIR Equipment:

❑ Check this box if tank gauging is used only for inventory control.
❑ Check this box if no tank gauging or SIR equipment is installed.

This section must be completed if in-tank gauging equipment is used to perform leak detection monitoring.

Complete the following checklist:

❑ Yes	❑ No*	Has all input wiring been inspected for proper entry and termination, including testing for ground faults?
❑ Yes	❑ No*	Were all tank gauging probes visually inspected for damage and residue buildup?
❑ Yes	❑ No*	Was accuracy of system product level readings tested?
❑ Yes	❑ No*	Was accuracy of system water level readings tested?
❑ Yes	❑ No*	Were all probes reinstalled properly?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

G. Line Leak Detectors (LLD):

❑ Check this box if LLDs are not installed.

Complete the following checklist:

❑ Yes	❑ No* ❑ N/A	For equipment start-up or annual equipment certification, was a leak simulated to verify LLD performance? *(Check all that apply)* Simulated leak rate: ❑ 3 g.p.h.; ❑ 0.1 g.p.h ; ❑ 0.2 g.p.h.
❑ Yes	❑ No*	Were all LLDs confirmed operational and accurate within regulatory requirements?
❑ Yes	❑ No*	Was the testing apparatus properly calibrated?
❑ Yes	❑ No* ❑ N/A	For mechanical LLDs, does the LLD restrict product flow if it detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if the LLD detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system is disabled or disconnected?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system malfunctions or fails a test?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, have all accessible wiring connections been visually inspected?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

H. Comments:

UST Monitoring Site Plan

Site Address: ____

VI. INITIAL STATEMENT OF REASONS

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

INITIAL STATEMENT OF REASONS

PROBLEM, REQUIREMENT, OR OTHER CONDITON ADDRESSED

These proposed regulations amend sections 2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, and 2666; and add new sections 2636.1, 2636.2, 2636.3, 2636.4, 2637 and 2644.1 in Title 23 of the California Code of Regulations (CCR). These regulatory changes are needed in order to implement Health and Safety Code (HSC) sections 25284.1 and 25292.4, and in part, to update the underground storage tank (UST) regulations to reflect the passage of previously established regulatory deadlines.

These amendments to Title 23 will:

1. Require UST owners or operators to conduct triennial testing of UST secondary containment systems, including testing of under-dispenser containment;

2. Require UST owners or operators of UST systems, which have a single-walled component and are located within 1,000 feet of a public drinking water well, to conduct triennial enhanced leak detection. This enhanced leak detection must be a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

3. Require all UST owners and operators, including those who own or operate single-walled UST systems, to install under-dispenser containment by December 31, 2003. Some UST systems must have the under-dispenser containment installed prior to that date.

4. Require persons who conduct UST monitoring equipment annual maintenance certification to have a California contractors license, and be certified, and triennially re-certified, by the manufacturer of the monitoring equipment being tested;

5. Require UST installers to be triennially re-certified by the manufacturer of the tank system being installed

General Statement of Reasons

The California legislature enacted Health and Safety Code (HSC) Chapter 6.7, commencing with section 25280, in 1984 and has since amended Chapter 6.7 in response to either federal mandates relating to underground storage tanks, or new information regarding changing industry practices and/or the performance of UST's meeting then current UST regulatory standards in California. In October 1999, the legislature again amended Chapter 6.7 by enacting Senate Bill 989, which essentially codifies executive order D-5-99. This executive order was the Governor's response to a University of California report on the environmental impacts of MTBE (an additive put into motor vehicle fuel beginning in the late 1980's, early 90's), and requires the phase-out of MTBE in fuel by December 31, 2002.

The University report concluded that, "while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water." This finding was in stark contrast to earlier studies regarding leaks of "pre-MTBE" motor vehicle fuel which concluded that the resulting groundwater plumes were very limited in extent (less than 250 feet), and rarely impacted public drinking water supplies. In comparing the different studies, the relative mobility and persistence in the environment of MTBE versus the most mobile constituents of "pre-MTBE" fuel (i.e. benzene, toluene, ethylbenzene, and xylenes) was illuminated, thus resulting in the subject legislation.

Since current underground storage tank laws and regulations were promulgated absent this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with more stringent construction and monitoring standards for underground storage tanks. These new construction and monitoring requirements were mostly based on the recommendations of two SWRCB panels, the Advisory Panel on the Leak History of New and Upgraded UST Systems (Leak History Panel) and the California Leak Monitoring group (CALM). The proposed regulations, where necessary, implement, interpret, and make specific, the newly enacted legislation.

EFFORT TO AVOID DUPLICATON OR CONFLICTS WITH FEDERAL REGULATIONS

Based on careful review of the federal underground storage tank statutes and regulations, the SWRCB has determined that none of the proposed regulations conflict with, or duplicate, federal rules. The SWRCB proposes to adopt these regulations, which are different from federal regulations, because these differing state regulations are authorized by Health and Safety Code sections 25284.1 and 25292.4.

ALTERNATIVES CONSIDERED

The SWRCB has considered alternatives to these regulations within the scope allowed by HSC sections 25284.1 and 25292.4. These alternatives are discussed in the Detailed Statement of Reasons below. The SWRCB has determined that no alternative to these regulations would be more effective or as effective and less burdensome to the affected industry, local governments, and state agencies than the proposed regulations.

DETAILED STATEMENT OF REASONS

The specific reason for each amended, added, or deleted regulation is summarized below.

Section 2611. Additional Definitions

This section defines the terminology used in Chapter 16. The three new definitions, "dispenser", "under-dispenser containment", and "spill containment or control system" are needed to implement new Health and Safety Code (HSC) subsection 25284.1, which specifically requires under-dispenser containment for all UST systems by December 31, 2003. Previously, under-dispenser containment was indirectly required by HSC 25291(a)(7)(E), which mandates secondary containment for piping for UST systems installed after July 1, 1987. This requirement for secondary containment includes the piping connected to the dispenser.

Section 2630. General Applicability of Article

Subsection 2630(a) is amended to reflect the current state of the law.

Subsection 2630(b) is amended in accordance with HSC section 25291(a)(7), which only allows alternative design and construction requirements for underground storage tank systems installed prior to January 1, 1997.

Subsection 2630(d) is amended to accommodate the new requirements for annual maintenance certification of UST monitoring systems as set forth in subsection 2637(b).

Section 2631. Design and Construction Requirements for New Underground Storage Tanks

Subsection 2631(a) is amended in order to ensure that secondary containment systems are designed and installed to be periodically tested in accordance with the secondary containment testing requirements of new section 2637.

Section 2635. Installation and Testing Requirements for All New Underground Storage Tanks.

Subsection 2635(d)(1) is amended in response to HSC 25284.1(a)(4)(A), which mandates the SWRCB to adopt regulations requiring underground storage tank installers to meet minimum training standards. The minimum standards set forth by the SWRCB herein are largely based on the SWRCB advisory panel report "Leak History of New and Upgraded UST Systems" which indicates that installation errors account for many of the leaks found in new and upgraded systems. Therefore, periodic installer re-certification is needed to ensure adequate competency in installing UST's properly. Additionally, UST installers need to continuously update their skills with respect to changing technology and installation methods.

Section 2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping

The title of Section 2636 is amended to accommodate the new requirements for under-dispenser containment mandated by HSC 25284.1(a)(5).

Subsection 2636(h)(1) is added to codify HSC subsection 25284.1(a)(5). Subsection 2636(h)(2) adds the requirement that under-dispenser containment must be continuously monitored and connected to an audible and visual alarm. This requirement is needed in order to clarify that visual monitoring is not acceptable for under-dispenser secondary containment systems.

Additionally, subsection 2636(h)(3) clarifies and implements the provision in HSC 25284.1(a)(5) that requires the SWRCB to approve dispenser "spill containment or control systems" capable of containing any accidental release.

Section 2636.1 Action by the Division Regarding Spill Containment or Control Systems; Section 2636.2 Petition for Board Review Regarding Spill Containment or Control Systems; Section 2636.3 Defective Petitions; Section 2636.4 Action by the Board Regarding Spill Containment or Control Systems

Sections 2636.1 through 2636.4 are added to outline the specific process by which a manufacturer may petition the Division and the Board for review of a determination by the Program Manager regarding the initial approval, or modification or revocation of prior approval of a spill containment or control system.

Section 2637. Secondary Containment Testing and Annual Maintenance Certification

Subsection 2637(a) is added because testing of secondary containment systems at the time of installation, and periodically thereafter, is required by HSC 25284.1(a)(4)(B). The initial post-installation test is set at 6 months after installation in order to ascertain the effects on the secondary containment system of factors such as: 1) settlement of the backfill; 2) installation errors (not found during initial testing); and 3) connections that have become separated as an indirect result of (1) and (2).

A 36-month cycle for testing the secondary containment system was chosen as a cost-effective compromise to the annual time-interval recommended by the majority of respondents to a secondary containment testing survey conducted by the SWRCB. The SWRCB believes that the slightly increased benefits to be gained from annual secondary containment testing (versus triennial) do not warrant the added cost to industry.

Subsection 2637(a)(1) is added in recognition of the difficulty, if not impossibility, of periodically testing some existing secondary systems after the first test at installation. However, because open secondary containment systems were initially installed in accordance with Article 3, they must meet the requirements of secondarily contained tank systems. Therefore the enhanced leak detection requirement is only used as an interim measure in lieu of the secondary containment testing requirements, until the secondary containment system can comply with Article 3 by either: 1) being replaced with a system that can be tested periodically; or 2) being tested by a method for adequately testing these systems that is developed within the 5 year interim period. The SWRCB did not want to extend the interim period beyond 5 years for the following reasons: 1) out of fairness to owners and operators of secondary containment systems that are currently able to comply with the secondary containment testing requirements; and, 2) to carry out the intent of the law that all systems installed after July 1, 1987 include effective secondary containment.

Subsection 2637(a)(1) does not prohibit replacement of the secondary containment system with another open secondary containment system. However, the new system must be designed to be periodically tested in accordance these secondary containment testing requirements.

Subsections 2637(a)(2) and (3) are consistent with current SWRCB regulations regarding the testing and installation of UST equipment. These requirements ensure that secondary containment testing is conducted properly such that the results of the testing are reliable. This reliability is obtained by testing the secondary containment in accordance with the specifications of the equipment manufacturer or, if there are no manufacturer specifications for secondary containment testing, in accordance with generally accepted industry practices. In some cases neither of these standards are available or applicable, and thus the local agency needs to specify the testing criteria.

Subsections 2637(a)(4) and (5) are needed in order to keep local agencies updated on the status of the site, and are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Subsection 2637(a)(6) is needed in order to provide an exemption for secondary containment monitoring systems that automatically and continuously test the secondary containment system by virtue of their design. Brine filled and pressure/vacuum systems rely on changes in the status of the monitoring medium in order to indicate potential leaks from the primary tank system. However, by the nature of this design, the monitoring system also works just as well for detecting leaks in the secondary containment since there may be loss of brine, or pressure loss/gain, through a breach in the secondary containment.

Subsection 2637(b) is a rewrite of former section 2630(d). Section 2637(b)(1)(A) implements the licensing requirements established for annual monitoring equipment certification pursuant to HSC section 25284.1(a)(5)(D).

Subsections 2637(b)(1)(B) and (C) are needed to ensure that annual maintenance technicians are adequately trained, and remain current with respect to the equipment installed at the facility being tested. Thirty-six months was chosen for periodic refresher training because this interval was shown to be an adequate balance, based on the best professional judgment of SWRCB staff, between the cost (in money and time) of recurrent training versus the need for the training. In making this decision, the SWRCB considered the following factors: 1) the rapidly evolving technology of leak detection equipment; 2) the large variety of leak detection equipment currently being used by industry; and 3) the frequency by which the work is conducted.

Subsection 2637(b)(2) is needed because a specific reporting form: 1) provides consistency for annual maintenance inspections; and 2) can be used as a checklist to ensure that all necessary work is completed.

Subsections 2637(b)(3) and (4) are needed in order to keep local agencies updated on the status of the site and are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Subsection 2637(b)(5) includes the requirement to affix a tag/sticker on each monitoring equipment component involved in the annual maintenance certification because these tags/stickers will indicate to local agency staff that at least the equipment was touched during the inspection. This requirement was recommended by the California Leak Monitoring Group report.

Section 2640. General Applicability of Article.

Amendments to subsection 2640(c) are editorial and have no regulatory effect.

Subsection 2640(e) is added in order to implement the enhanced leak detection requirements of HSC 25292.4(a). The exemptions specified in 2640(e)(1) are the same as those allowed for new double-walled systems. The reconsideration clause in 2640(e)(2) and (3) allows tank owners or operators to contest SWRCB notification in cases where they believe this notification was done in error thereby obtaining relief from the enhanced leak detection requirements.

Section 2641. Monitoring Program Requirements

Subsection 2641(j) is amended to accommodate the new requirements for annual maintenance certification of UST monitoring systems set forth in subsection 2637(b).

Section 2644.1 Enhanced leak Detection

Section 2644.1 is added to specify the requirements for enhanced leak detection in accordance with HSC 25292.4(a). Subsections 2644.1(a)(1) and (2) represent the SWRCB's chosen methodology and performance requirements for implementation of the enhanced leak detection provisions of HSC 25292.4(c). In preparing these requirements, the SWRCB complied with the provisions in HSC 25292.4(c) that the SWRCB shall: 1) consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures to implement the enhanced leak detection or monitoring program; and 2) consider existing leak detection technology (internal methods) and external monitoring techniques or procedures for underground tanks. The above was accomplished by holding a staff level public meeting on October 28, 1999; and through full consideration of related written comments submitted to the SWRCB which proposed both internal and external methods and technology for enhanced leak detection.

In evaluating options for enhanced monitoring, the SWRCB weighed several factors including method sensitivity, reliability, initial and repeated costs, and potential interruption of business activities. Regarding method sensitivity and reliability, the SWRCB looked for a cost-effective method that was more sensitive than current monitoring techniques while maintaining the same reliability. The SWRCB believes that increased sensitivity is necessary to determine if single-walled underground storage tanks are leaking below the regulatory established monitoring sensitivities for the various single-walled monitoring methods. The SWRCB suspects such slow leaks may be occurring given that fuel leaks impacting soil and groundwater have been discovered (during removal) under, and around, many single-walled UST's with no record of any unauthorized releases in their monitoring history. Since 0.1 gph is currently the highest sensitivity required for leak detection monitoring in California, in order to achieve the above goal, the enhanced leak detection sensitivity is set at 0.05 gph, or less.

The California reliability standard (adopted from federal standard 40 CFR 280.40(a)(3)) is a leak detection monitoring performance standard for the probability of detection (PD) and probability of false-alarm (PFA). This standard is the same regardless of the method sensitivity established in the UST regulations and is set at 95% PD and 5% PFA (i.e. 95/5 reliability). Thus, statistical inventory reconciliation (SIR) which, by California regulation, has a sensitivity set at 0.2 gph, must meet the same reliability standard as a tank-tightness test which has a sensitivity set at 0.1 gph. The SWRCB also looked at additional aspects of monitoring method reliability, such as the method's ability to find the location of a leak, and its reliability in determining if detected leaks came from the tank and piping rather than spills and overfills, from prior tank operations, or other sources.

Only one of the proposed enhanced leak detection methods was able to meet all of the SWRCB requirements for enhanced leak detection. This was an external monitoring method using a benign chemical, with unique characteristics, introduced into the tank and monitored outside the tank system via a network of sensitive probes.

The internal monitoring methods proposed (i.e. automatic tank gauging and statistical inventory reconciliation) were unable to meet the reliability standard at a leak-rate sensitivity less than 0.1 gph. This was also true for the other proposed external methods (i.e. fuel vapor monitoring, ground water monitoring, and soil and ground water investigations). Additionally, these methods were unable to locate a leak or clearly determine if a fuel component came from the tank system, from spills and overfills, from previous tank operations, or other sources.

Subsection 2644.1(a)(3) codifies the provision in HSC 25292.4(a) that UST owners or operators, who are required to conduct enhanced leak detection, implement a program of enhanced leak detection by November 1, 2000. The November 1, 2000 deadline was not specified in the regulations since the UST owner or operator needs to first be identified by the SWRCB according to its Geographic Information System (GIS) mapping database, in order to know for certain their facility is located within 1,000 feet of a public drinking water well. The SWRCB expects to have made all notifications months before the November 1, 2000 deadline. A 36-month cycle for enhanced leak detection was chosen as a cost-effective compromise to a 12- or 24-month cycle. The SWRCB determined that a 12- or 24-month cycle would not provide additional protection of public drinking water wells commensurate with the added cost of enhanced leak detection.

Subsections 2644.1(a)(4) and (5) are needed in order to keep local agencies updated on the status of enhanced leak detection at the site, and to provide the results of the enhanced leak detection to the local agency and the SWRCB. With the exception of reporting the results to the SWRCB, these requirements are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Section 2660. General Applicability of Article

Subsection 2660(h) is amended to accommodate the new under-dispenser requirements for single-walled tank systems in accordance with HSC 25284.1(a)(5)(C).

Section 2666. Requirements for Upgrading Underground Piping.

The title of section 2666 is amended, and subsection 2666(e) is added, in order to implement the new under-dispenser requirements for single-walled tank systems in accordance with HSC 25284.1(a)(5)(C).

VII. TRANSCRIPT OF PUBLIC HEARING RELATING TO PROPOSED REGULATIONS

CERTIFIED COPY

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CALIFORNIA STATE

WATER RESOURCES CONTROL BOARD

UNDERGROUND STORAGE TANK REGULATIONS.	)

TRANSCRIPT OF PROCEEDINGS

July 18, 2000

10:00 A.M.

900 South Freemont Avenue
Conference Room B
Alhambra, California

REPORTED BY:
Silvia D. Giddis
CSR No. 12014
Our File No. 1-65555

APPEARANCES:

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INDEX

MS. HAVEN: We'd like to get underway at this time. I'd like to welcome you all here today. My name is Liz Haven. I'm the underground storage tank program manager for the State Water Resources Control Board. And we are here this morning to conduct a public hearing to receive comments on the regulations implementing SP-99. And this morning, I'd like to introduce the people right here on the panel: To my right is Pete Silva. He's our newest water resources control board member, and he will be conducting the hearing this morning.

To my left is Chuck NeSmith, who has written the regulations the primary staff person responsible for the rule making effort. At the other table is David Boyers from our office of Chief Counsel, and he's the attorney advising on these regulations. To his right is Shahla Farahnak, who is our senior engineer in prevention, and we have a court reporter here today, named Silvia Giddis.

So you will note that your comments will be transcribed, and the State Water Board will be responding to those comments in our written response comments. Now, I'd like to turn over the proceedings to Pete Silva, who has a statement to make.

MR. SILVA: Thank you. Good morning, ladies and gentlemen. My name is Peter Silva. I am a member of the State Water Resources Control Board. Now, is the time and place for public hearing to receive testimony regarding proposed amendments to the regulations governing underground storage tanks. These amendments are being made to interpret, clarify and implement legislative changes made to Chapter 6.7 of Division 20 of the Health and Safety Code pursuant to Chapter 812 statutes of 98 and 99, or shares that were built by 99.

The proposed changes were noticed by May 12, 2000 for a 67 day comment period. The comment period concludes at 5:00 p.m. today, July 18, 2000. Anyone wishing to address the Board at this time should complete one of these cards located on the front table and handed to Julie Berrey there with the light tan suit on.

When you speak, please be sure to state your full name and address at the beginning of your testimony, and also please spell your name for the transcriber's benefit. To ensure that everyone has an opportunity to speak, I may find it necessary to limit oral testimony to a specified time limit. Although, we only have seven speakers right now, so that may not be an issue today. Again, I repeat, if you want to speak give us your card.

Written comments will be accepted until 5:00 p.m. today at the Division of Clean Water Program at 2014 T Street, P.O. Box 944212, Sacramento, California, 94244-2120. Although, I think as long as it's postmarked today, I think we will go ahead and accept that, as long as you get it postmarked today, we will accept it.

All testimony and written comments received will be reviewed and answered. Any changes made to the proposed amendments as a result of the oral testimony and written comments will be sent out for an additional 15-day comment period as provided by law.

The Board will subsequently consider adoption of the proposed amendments, and any revisions to the proposed amendments, at a regular workshop and business meeting to be held at a later date. And with that now, chuck NeSmith will give you a brief presentation on the underground storage tank program.

MR. NeSMITH: Okay. As you heard earlier these regulations implement Senate Bill 989. Senate Bill 989 essentially codifies executive order D-599 during the Methyl version needle Ether commonly known as MTBE. The executive order recommends phase out against MTBE by December 31st, 2002. 99 made MTBE phase out walk and supplemented the phase out with more stringent underground storage tank construction tanks, which we are looking at today.

The reason why they banned MTBE was one phase of that is because is persistent on the environment, very mobile and ground and because of this it can and does carry municipal and domestic well. Senate Bill 989, enacted seven major amendments and underground storage tanks statutes regarding tank installer training, certification, training, perennial monitoring and maintenance inspectors, secondary container testing enhance leak detection under dispenser containment, local agency inspection and training for owners and operators, and the last two local agency inspection and training for owners and operators not included in this package, but it will be included in a follow-up package within the next couple of months. Okay. Tank installer, what I am going to do is go over what the existing requirements are and bear that to the proposal requirements.

Tank installer training. Existing requirements are for the installer to have adequate from the manufacture of the tank that is being installed, minimum one month training course. The proposed department is to have a triannual recertification. Every three years you'll have to go back to the manufacture and retrain and certify.

Annual monitoring and maintenance inspection. Existing requirements: There are none. There are no requirements regarding who can do inspections. The proposed requirements are: Licensing by the Contractor State Licensing Board, and there are several licenses we've identified that can be used for that. Initial certification and triannual recertification by the manufacture, monitoring equipment that was installed at the facility. The use of a formal certification form, which is also included in the regular package. This comes effective January 1st, 2002.

Secondary containment test.

Existing requirements: It must test at installation. Proposed requirements will be to test that installation, and then do triannual testing to the same manufacture's specification used for testing and installation. This becomes effective January 1st, 2001 for new installation i.e. those that are installed after January 1st, 2001. For installation prior to that date, the triannual testing for secondary containment begins 2002.

Systems unable to be tested must conduct enhance leak detection, which I will discuss later, and replace the system in five years or test by a newly development method. Some of the secondary containment cannot be tested. One example is the line trans system. They were tested in installation, but because of their construction, it's just not practical to do additional secondary containment testing. And so we have the permission here to do one time enhance leak detection and get rid of their system within five years, unless they come up with a method, which they can do secondary.

System that are already continuously tested by virtue of design, such as hydro stot system are exempt from the secondary containment testing. And that is because by virtue of the way they do their continuous monitoring. They already test the secondary container an example of that would be vacuum system pressurize space.

Enhanced leak detention.

This applies to underground storage tank systems with a single wall component within 1,000 feet of public drinking water.

Existing leak detention requirements.

Single wall tank systems must be monitored in accordance with Article 4. Common methods are automatic tank gages, statistical reconciliation, finding detectors coupled with periodic testing pipe. There are no additional requirements currently based on distance from public drinking water wells.

The proposed requirements.

Underground storage tank systems with a single wall component located within 1,000 feet above a drinking water well. Must continue with current approved monitoring for the site, and conduct triannual enhanced leak detection using a test method that ascertains the integrity of an underground storage tank by introduction and external detection of a substance that is not a component of a fuel formulation of the store in the tanks.

Site to be identified.

Underground storage tank sites subject to enhanced leak detection requirements will be identified by the State Water Board geographic information system mapping data base currently being prepared for this activity.

Band or tankerizer piping, vapor recovery piping that suction piping that meet the definitions of section 2636 A 1, 2 and 3 are exempt from being considered single wall components. We do not, even on a double wall tank system, these are ordered to be double walled.

Can the State Water Board identification be appealed?

An owner and operator or who has been identified as having single walled tank system within 1,000 feet of a drinking water well, who objects to this may petition in writing to the division of clean water program underground storage tank program manager. The program manager shall make a decision on the vision within 30 calendar days of the receipt of the petition. The initial deadlines are: Owners and operators must have a program with enhanced leak detection reviewed and approved by the local agency within six months falling notification by the State Water Board.

After they have been notified, this plan must be implemented no later than 12 months following receipt of notification from the Board.

Under dispense containment.

Existing requirements: Underground storage tank systems installed after July 1st, 1987 need secondary containment for piping. This includes under dispersement containers.

Proposed requirements: Underground storage tanks installed after July 1st, 1987 without underground -- without under dispersement containers -- I'm going to have to back up a little bit because many systems were installed after 1987 without the under dispersement container..

There is a problem in that regard, and that's one of the reasons for this stipulation and 7-09-89. So those systems that do not do that, did not install under dispersement system when they should have, and are located within a thousand feet from a public drinking water well, must install under dispersement containment or a spill containment or control system by July 1st, 2001. All other underground storage tank systems, including single walled tank system must have under dispenser containment or a spill control or containment system installed by December 31st, 2003.

And that concludes the description of the regulations for today.

MR. SILVA: Okay. Thank you, Chuck. Now, we will get into the public comment part of the meeting, and again, if anybody has a desire to speak and have a blue card, please bring it out to the table by the easel, so we can have an idea of how many speakers we have. Right now we don't see a problem with time, so the speakers can speak without worrying; however, I still want to ask you to limit your comments, make them as brief as you can.

And if you have written comments, just summarize the written comments and you can give it to us also. So why don't we start with Jerry Usrey, Bravo

Systems.

MR. USREY: Jerry Usrey, U-s-r-e-y, with Bravo Systems. What we are looking for as a manufacture of dispenser containment since 1985, we have had a float trip mechanism that has been used as a form of monitoring, and has been accepted up and down The State of California by the different agencies, and also by many of the current groups of people.

In the clarification of monitoring for dispenser containment, it says in one of the paragraphs that this needs to be a audible visual alarm, and the regulators that we've dealt within the past have taken that audible vision as a way -- 'cause what this mechanism does it actually stops the flow of product. So you have an audible person out there that is saying, "I can't get my gasoline," and you have a visual because the dispenser is not pumping gas.

This form of leak detection, which is constantly there in a mechanical form, is not dependent on any kind on electrical source, and it's actually got in many of our dispenser containment pans has actually three floats so it's a redundant type of detection. But depending on the interpretation of audible or visual alarm, will depend on whether that is an accepted method, and so we are hoping to get some clarification by The Board.

Along that line, as far as what is used instead of a float mechanism it's a sensor that is put in that may also shut off the dispenser and alarm of belt, but you still may have product leaking into that dispenser containment. So that's where the float trip mechanism was adopted and accepted because it actually stopped the flow of the potential leak.

The other area that we are not sure whether as a dispenser containment manufacture we should be looking at is certifying the installers. Now, because the dispenser containment box that we sell or some has this float mechanism, it is also a form of leak detection, and we are not sure if that requires us -- we have done training of all our installers in the past, but to make sure we are keeping them up to date per the requirements, I need to know if that's something that Bravo Systems should be doing because they are manufacture dispenser containment again.

The area that I would like personally some clarification on is, as far retesting of sumps, and you mentioned, and maybe you can clarify this now, is that it's per the original manufacture's test. And when I've gone back to the regulatory community that I deal with and I say, "Well, my manufacture's test it's a visual inspection" because it would do me, as a manufacture of any type of any type of secondary containment system, which we have many of them here in the audience today, for me to come up with a more stringent type of test, then visual inspection is going to send me out of the market.

We all know that now when the sensor is installed, whether it's a dispenser sump, turban sump, they are water tested. In many situations where the sump is filled with water above that highest penetration fitting and leaks are looked for. To try to do this in the future with existing sites, where we have some sumps that can hold 300 gallons of water before you would get above that penetration fitting, we'd stand the chance of contaminating the ground with 300 gallons of contaminated water.

And I know the industry is looking for other methods of testing, but the manufactures, in my own representing different manufactures, which I have several different forms of secondary containment systems, it's not in their best interest at this time to propose any more stringent of a test than a visual test. And when I propose this to the regulatory community they said, "Well, we are not going to accept visual testing, Jerry. That's ridiculous."

However, the statement says that as the manufacture, that's all we require, and in some cases for some of the equipment, that's maybe all that it would be required. So if we can get any clarification on that. And I think those are the main issues we have.

MR. SILVA: Thank you. By the way did you put those in writing to the staff, those comments?

MR. USREY: No, but I guess I can.

MR. SILVA: Okay. Thank you. Now, we'll go to

Mark Taylor from Mosier Brothers.

MR. TAYLOR: Thank you. I am Mark Taylor, Mosier Brothers Storage Tanks in Wooland, California. I grew up in the tank system, and I am currently president of Mosier Brothers. I'd like to comment when manufacture training of installers and triannual secondary containment testing. Section 2635(b)(1) requires installer training that we've heard about. I don't know how much of that, and especially refresher course it's really necessary.

Within my working life time, there has only been two real structural changes steel underground storage tanks, single to double wall and some reduced thickness, basically the tank is set on the ground compacted, back filled and so on, the same way today as it has been in three more years. I think it's going to be the same in 30 more years. I imagine it's going to be the same.

Piping and equipment do change and probably do need continuous refresher courses. I don't think the tank is going to change that much. Currently a lot of this instruction is done voluntarily. It's not in my best interest to be part of a bad installation. I think we all work pretty hard to be sure that what's going in the ground is going in correctly, without being a legal requirement.

I'd like to comment on the triannual secondary containment testing or continuous monitoring. I don't think this is really necessary for double walled tank. Mosier Brothers has developed and built the only permanent vacuum monitoring tank in the country. And I think it is correct that vacuum -- to recognize the vacuum or hydro static it's a better tank.

I also would like the chance of basically mentioning The State regulations, I think that would be a real sales aid, but I don't think is absolutely necessary as shown. The vacuum hydro static test, which is probably how other double wall tanks would be tested every three years, test a lot of the tank that really isn't important. A small leak in the secondary at the top it's probably never going to leak fuel. The more common float switch at the bottom is going to be picking up, I believe, the things that are real problems. Thank you.

MR. SILVA: Thank you for your comments. Dennis Rock of Dennis D. Rock Construction.

MR. ROCK: Dennis Rock, R-o-c-k. Couple of comments about the under dispenser pin monitoring. I am a little concerned that with this continuous monitoring that the proposal is requiring in trying to retrofit the existing pins that have already been installed, we may be opening up a big can of worms because we have to go in and break the integrity of this pin to install conduit to get the sensor up into the pin, if you do it underground in a nice clean method.

If we do it above ground or over the top of the

island, we may raise other issues as to client safety A.D.A. compliance of this nature. The full system that is predominately used in most of the pin is, if maintained, and I have to put that in there, by the owner operator of the station is more than adequate to recognize any leaks that occur within the dispenser or the pump system.

And to trip the shear belt, which shuts off the flow of product. Once the flow of product is off, and there is no more pressure on the dispensing system, via the bottom site of the pump, or the actual dispenser, if it's a subunit, you got no more leak. Another issue that we are faced with is that the pins are designed in such a manner that the flow sets below the bottom level of the pan.

And this little containment fills up and trips and makes the float rise. Any kind of a float sensor that is added is going to be above that level, so the shear valve is going to be tripped, the product flow will be shut off long before the product level gets high enough to engage that float sensor, so that it will do the audible visual program that's in the proposal.

So it's kind of a redundant spending of lots of dollars that aren't going to accomplish anything on benefit -- to the benefit of the environment or the guy that's paying the check, actually, in the interim; because there is a lot of people out there that brought their systems into compliance within the last 12 to 18 months before the deadline.

Now, we have to go back to them, and say, "Well all that concrete that we put in, it's all got to come out. We have to add more conduit. We have to put another sensor in each one of your pins." And now we run into a problem of do we have a monitor that has the capacity to handle the additional sensors. He may or he may not have that style of monitor.

So now he's going to spend more dollars to enlarge the size of the monitor. So it just keeps getting to be a larger and larger problem, and it doesn't really accomplish anything that hasn't been already taken into consideration by the float switch itself.

You'd mentioned about the hydrostatic test, and the way the exception is written in the regulation, if I am understanding it correctly, any type of a sensor that would recognize in the double wall tank system intrusion of ground water from the outside into the inner space or, intrusion of product from the primary to the secondary, would exempt that tank from your triannual testing of the triannual test; is that correct?

MR. NeSMITH: The exception is set up --

MR. ROCK: And you've got it written in such a manner that you only use those two examples of hydrostatic --

MR. NeSMITH: Those are just examples. There are other systems --

MR. ROCK: Any kind of a float switch that's in there is going to react, unless it's a product specific float switch, it's going to react to water coming in from the outside world or product.

MR. NeSMITH: If there is water, if the tank is embedded in water --

MR. ROCK: Well, obviously there is. So does that say then that the regular float switch that most systems have exempts that?

MR. NeSMITH: We are going to respond to that. I'll think about that. That's an issue we can't consider here --

MS. FARAHNAK: I can help you answer. Our intention was that if you -- the intention was that if for some reason both primary and secondary fail, the leak detection mechanism should be capable of detecting that situation. So the float may not qualify for that condition.

MR. ROCK: If both the primary and the secondary fail simultaneously.

MS. FARAHNAK: Simultaneously. And then we have to make a determination under those conditions will the float switch effectively detect the leak.

MR. ROCK: How is that situation going to be averted by triannual testing?

MS. FARAHNAK: What I meant, in order to be exempt from that testing, that's one of the things I will be looking at.

MR. ROCK: So the liquid level on a hydrostatic would disappear.

MS. FARAHNAK: Yes, and the vacuum --

MR. ROCK: And the vacuum would disappear.

MS. FARAHNAK: Yeah.

MR. ROCK: Okay. A comment about 25284.1 (6)(b), where The Board is -- you're going to have the Contractor State Board, Air Pollution Patrolling Industry, all of these people get together? I notice that there is no contractor representatives involved in that.

MR. NeSMITH: That's not part of this regulation, the proposed regulation. That's in Bill 989 but none of it relates to that.

Mr. ROCK: Okay. Then, I have no further comments. Thank you very much.

MR. SILVA: Thank you, sir. Next Sandra Nimmo; Afforda Test.

MS. NIMMO: Hi, I am Sandra Nimmo from Afforda Test, and the last name is, N-i-m-m-o. And we are a testing company. We do all the testing on the tanks now, including vapor recovery, monitors, secondary containment tank lines, leak detectors if there are leaks, whatever needs to be done.

We have some confusion a little bit on this contractors' board designation. I am wondering -- we never have gotten a reason why that is being implemented. We did hear one thing that it was because we have some people cheating in the industry, and so this was some way to kind of reel them in or have some recourse against those companies.

I personally -- our company personally doesn't have anything against being licensed by The State as a contractor; however, the choice of licenses are so impertinent to what we do. We are constantly in classes everywhere, all over the state, out of state, having to pull men out of the field to attend classes, the expense to them is expensive.

Then to have to certify them, and take those license for something that, if it's shortening wall or pouring concrete, or something like that, it's kind of a waste of the tester's time to have to be setting this just to have a license that you can hang on the wall. I guess my question is, is there something that can be handled with The Contractors Board that maybe a license for testors could be come up with during that time, so that if we are going to take a test and study, that we can be studying this stuff that's just pertinent to us.

MR. NeSMITH: I am a little confused. You're talking about licensing pertaining to installation, monitor maintenance --

MS. NIMMO: No. The license -- having to have a contractor's license to be a tank tester.

Mr. NeSMITH: No. That's not -- the tank testing regulation is something completely different.

MS. NIMMO: Well, that's what we were told.

MR. NeSMITH: No. We are not adding any requirements to the tank tester regulations.

MS. NIMMO: So we do not have to have a contractor's license as of 2002?

MR. NeSMITH: Unless it's already incorporated in the current regulations at this time. Those regulations -- the tank tester regulations are not up for proposal today, and there is no new requirements as far as I know. What I thought you were referring to was the annual monitoring maintenance.

MS. NIMMO: That's part of your testing, yes.

MR. NeSMITH: Okay. That would be part of it as a contractor.

MS. NIMMO: And so we are going out there and checking the monitor box and putting the sensors into alarm and that kind of thing, and now we are going to have an A license or something like that?

MR. NeSMITH: You're going to have one of several licenses.

MS. NIMMO: So I guess that's the point it's --

MR. NeSMITH: I guess I was getting confused.

MS. NIMMO: That's an awful lot of learning something else just to do what we do, which is completely different. You know, what I mean? It seems like overkill to have an A license or B license. I can't find the information on the C-61 to know just exactly what that is.

MS. FARAHNAK: Chuck, actually you brought up a good point is that we have a series of licenses listed in the tanks for people who do the maintenance. One of those is a service station contractor category that has not been active. And currently we are working with State Licensing Board to make that active, and actually make it totally appropriate and relevant to what you're doing as a contractor to do -- add the certification, and I'm recording it in those efforts with every social board to include testing of a recovery system as well. So we are aware of that.

MS. NIMMO: So the C-61 it's been kind of an inactive one that they're now going to remake active and adjust it to fit the circumstances.

MS. FARAHNAK: That's our intent. That's why we are working with The State Board and Contractor State Licensing Board, are working together.

MS. NIMMO: And so that will be implemented and that will be by January 2002. That will be done, and give us time to study.

MS. FARAHNAK: I can't give guarantees, but that's our goal. And that's why we have that longer time frame.

MS. NIMMO: So we just kind of wait, and we will all be informed. And it will be per every test, or we will have to have a contractor's license rather than just a company license, regular contractor's license; is that correct?

MS. FARAHNAK: I think that's a legal interpretation that hasn't been decided. I will respond in the comments to that.

MS. NIMMO: Okay. Thank you.

MR. SILVA: Thank you. Next Wayne Geyer from the Steel Tank Institute.

MR. GEYER: Wayne Geyer, G-e-y-e-r. I guess since there is only three more commentators, and there are six hours left, I should hold my comments to under two hours. I do have a lot. I am going to give you -- I am going to go read most of it, and I do have a couple of comments I want to add on top of that, based on what I've heard this morning.

Steel Tank Institute is a non-for-profit trade association. We represent over a hundred shops that build underground and aboveground steel storage tanks. We develop stands for fabrication and installation of underground and aboveground fabricated steel storage tanks.

I want to specifically comment on the three-year testing requirements of secondary containment systems. I'm going to sound like one of these guys that goes back in time, but I do want to review some of the construction methods that have been used for secondary containments of steel storage tanks that goes back to the early '80s.

I would assume some of those tanks are still on the ground in California. Some standards and installation practices have evolved since that time. The ability to test the containment will require some understanding of the type of tank system in the ground, and will also require an understanding of how the tank was installed.

Ultimately, testing the secondary tank containment will entail a considerable cost to the owner/operator to test the containment. And after seeing the initial comments where you talked about 59 million dollars, I guess you already recognize that. Initially, double wall steel tanks were built to contain 110 percent containment of the primary tank. This is going back to the early '80s.

The outer walls of such tanks, steel tanks were built similar to aboveground storage tanks. The fabricator shipped the tank with an interstitial monitoring pipe, external to the tank heads that terminated, really flush with the top of the tank. These tanks can normally be tested with three to five pounds of air pressure. However, vacuum testing would not be a recommended practice of those type of tanks without an individual structural analysis being done of that tank in its buried condition.

In 1984, the Steel Tank Institute developed the nation's first national standard for secondary containment tanks. About a year later UL introduced secondary containment into its UL 58 tank standard for steel storage tanks.

We call our standard the Dual Wall Tank Standard. The steel secondary containment shell was wrapped directly over the primary tank and typically provided a hundred percent containment. The volume of that interstice was very small with respect to the previous design that had 110 percent containment. However, the space was large enough to allow any release of stored liquid, or to allow any intrusion of ground water to travel to a monitoring pipe or port.

The monitoring pipe was normally extended to the top of the tank, usually external to the tank head by the fabricator to enable the tank to be shipped to the site. According to that standard the monitoring of the interstitial space could be accomplished by one or more of the following methods: Electronic monitoring, that was constant. Mechanical float devices. Pressure or vacuum, and even regular sticking of the interstitial.

The flexibility given to leak detection monitoring at that time was intentional. It enabled, what we hope were innovative forms of technology to be developed to detect releases. It also enable release detection systems to be developed that could monitor, not only the tanks, but could also monitor other components as well.

And I would hope that if The State does require people to go out and test every three years, that they will be open to all these different options in the future. STI members use a third party insurance carrier to oversee a national warranty program on several significant types of underground steel storage tank technologies.

With over 60,000 secondary containment tanks in their database for STI labeled Double Wall Underground Steel Tanks; there have been no reported incidents of a release from any primary tank in the ground water with these STI labeled secondary containment tanks. That's a release from the primary tank in the ground water.

Most of these tanks were built either to the STI dual-wall tank standard UL 58 and/or UL 1746 Part III for jacketed tanks. Again, these tanks were shipped with the interstitial monitoring port flush with the tank top, in most cases, which provide flexibility to the owners/operators installers to place various forms of release detection equipment in the interstice. As an end result, there is a wide variety of the secondary containment systems in place.

Speaking to some of our members prior to the hearing, some of them estimated that at least a quarter to a half of the existing tanks, secondary containment tanks, would require some additional work in order to perform the task that we think is required by Section 2637. For example, not all installers extended the monitoring pipe to grade.

Instead the leak detection device was mounted directly into monitoring pipe and buried flush with the tank top and several feet below grade. Keep in mind that many of these tanks were installed before or at the advent of sumps that were placed above the top of the tank. Some sumps were installed over the top of the tank to contain tank accessories. It wasn't until the early '90s that UL accepted secondary containment monitoring pipes to be installed inside the steel tank where the monitoring port can be easily made accessible within a sump.

Thus, in order to test the tank secondary containment the owner/operator may need to hire a contractor to cut through the concrete and dig to the top of each tank in order to access the interstice. For those systems in which the contractor extended the monitoring pipe to grade, such extensions were made liquid tight, but may not be pressure or vacuum testable without additional work being required.

This can have an impact on the tank owner's operations and will certainly generate some expense in order to meet the rule. This issue wouldn't be limited to steel tanks only, as I believe Non-metallic tanks also relied on monitoring probes for release detection of the interstice until recent times.

During the past decade, we've seen additional changes to the construction of steel secondary containment tanks. After UL published its UL 1746 Standard or corrosion control 1989, jacketed tanks became a common type of construction for the steel industry. Jacketed tanks use some sort of plastic outer containment that also acts as a corrosion control barrier. Probably the most common material for the steel tank jacket has been fiberglass or of course plastic.

Now, most jacketed tanks today are shipped with a vacuum in the interstice. The monitoring port is usually accessible within a tank sump. Usually the vacuum is released upon completion of installation and again, various forms of release detection can be installed into that interstice.

With these most recent installation, there should not be significant hardship to access the interstice, but there will still be an expense to hire a contractor to say perform a vacuum test, should these other forms of equipment not be recognized, like the electronic monitoring and float devices. Based on the performance history of STI labeled tanks, we question the need for such regular three-year testing of the outer tank containment to take place.

Section 2637 (2) states that secondary containment systems must be tested either in accordance with manufacturer's guidelines or instructions or by an industry code or engineering standard. We'd like to point out at this time that the 1996 edition of the NFPA 30 Flammable and Combustible Liquids Code has language mandating a tightness testing of the interstitial space of underground secondary containment tanks prior to placing the tank in service, meaning prior to installation, or prior to being put in service.

It states that the interstitial space of such tanks shall be tested either hydrostatically or with air pressure at three to five psig or vacuum at 5.3 inches mercury, or in accordance with the listing or the manufacturer's instructions. The pressure or vacuum shall be held for one hour.

STI would recommend a secondary contained steel tanks built to our dual wall tank standard to UL 58 Type one secondary containment tanks, or to the UL 1746 requirements for jacketed tanks can be vacuum tested in accordance with the NFPA 30 standard. Steel tanks with 110 percent containment can be tested with air, but with no more than three psig, with the approval of the original tank manufacturer.

Section 2637(6) of the proposed regulation exempts periodic secondary containment testing, where the continuous monitoring automatically monitors both the primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum.

We feel that a vacuum or pressure system can have a greater sensitivity in detecting a release than hydrostatic, but we notice there is no criteria to evaluate such systems. For example, some hydrostatic system rely on visual examination of a chamber filled with liquid, installed within a sump, to determine if a release has occurred.

Similarly a pressure gauge could be mounted within a sump to provide indication that a pressure or vacuum is maintained within the interstice. Both methods rely on the owner/operator to visually inspect the equipment on a regular basis. There is no requirement of an alarm or any other device to detect leaks on a continuous basis in this section.

I'd like to add one other thing. By having someone go out and test the tanks every three years, my biggest fear is, if someone tries to put a large pressure into the interstice space say a jacketed tank or something of that nature, and they use an air compressor that they are going to overpressurize the system, in the end in essence may do more harm to the system, than if there wasn't any testing done at all, and if they relied on the existing electronic equipment or float gages.

As I said before the volume of the interstice is very small, and if someone goes out and tests the tank without knowing what the system is without knowing the limitations of the test they want to perform, they could in essence cause more damage to the tank, than if there wasn't any test at all, and cause a release.

So in conclusion we'd like to summerize our primary comments. One, existing secondary steel tanks in California have various constructions features. Two, access to the interstitial monitoring port of the tank may cause an inconvenience and expense to system owner/operator. Three, the performance of STI labeled secondary containment tanks with various forms of release detection equipment suggests that testing the containment every three years may not be necessary for safeguarding human health and the environment.

Four, the NFPA 30 Standard gives an excellent guidance for testing secondary containment underground storage tanks, if California goes that route. And fifth, relying on a visual examination of quote, "continuous" monitoring systems may not provide the equivalent results desired by California agencies. Thank you.

MR. SILVA: Thank you. Mr. Geyer. Next Ron Wilkniss from WSPA.

MR. WILKNISS: Good, morning Mr. Silva and member of the staff. My name is Ron Wilkniss, W-i-l-k-n-i-s-s. I am with the Western State Petroleum Association. I guess you'd like my address too. It's 505 North Brand, B as in Bob, Brand Boulevard in Glendale. Wester State Petroleum Association for the oil industry in the western United States is the major that tends to members of our companies, and many our members companies, of course, operate in retail gasoline outlets having underground storage tanks, and would be impacted by these proposed amendments to the USC regulations.

I'd first like to note that I appeared before members of the State Board just six weeks ago. The occasion was a hearing regarding WSPA's appeal of the action taken by the Los Angeles Regional Board to pose stored water treatment or infiltration requirements at retail gasoline outlets. By contrast to the Regional Board directed promoting infiltration into the soil, these proposed amendments are much closer to what WSPA can support because they are designed to further protect the subsurface environment.

I would like to thank the staff for soliciting our input very early in this process, in particular Allan Potman, Chuck NeSmith, who worked very hard to understand our views and our concerns. Thank you, Chuck.

These final proposed amendments are now much close to what we can support. As I said a second ago. WSPA has submitted a comment letter on the proposed amendments. I do have a few extras copies this morning, if that would be helpful. My purpose in being here today is not to reiterate all the comments in the letter, but merely to underscore a few point.

First, we've suggested that provisions be added to the regulations to eliminate or at least minimize testing requirements whenever a facility elects upgrade UST components. Our suggested provisions would, for example, apply to facilities that elect to replace single wall components, trench lines, secondary containment systems, and so forth. These provisions would be appropriate, in our view, for the simple reasons that this would provide additional incentive to the facilities to upgrade to protect -- to expedite the system upgrade.

Second, perhaps the greatest issue of concern to WSPA member companies is that of enhanced leak detection. Enhanced leak detection must be conducted triannually by facilities, which have any single wall components, as defined in the regulations, and are within a thousand feet of a public drinking water well. While the concept of enhanced leak detection itself is not troublesome to us, the specific requirements are significant concerns.

First of all, with respect to what we would describe as sole source, the criteria for testing are such that the requirements can only be met by a single vendor Tracer Research Corporation. While we have absolutely nothing against Tracer Research or their proprietary technology, the regulated community would really like to avoid to being wetted to a single supplier.

We believe that there is a demonstrable need for alternative technology. We understand that there are certain sites, specific conditions that actually preclude the use of Tracer Research technology, consequently, it seems to us that there is an absolute need for other options. Yet, these options do not currently exist in the proposal.

We think that it may be premature to specify the requirements for enhanced detection at this time. The Board pursuant to the provisions of Senate Bill 989 is not to embark on statewide field base research program. Tracer Research Corporation is the contractor for this program. Thus, within the foreseeable future California State coders can expect to gain a lot of experience using Tracer Researcher's methods.

WSPA believes that we should give ourselves the opportunity to benefit from this experience, before specifying the requirements for future enhancement leak detection testing. And we would respectfully request that either the testing specifications be structured so that there can be met by more than one contractor, or that the requirements not be set in place at this time. Thank you, and I'll be happy to address any questions.

MR. SILVA: Thank you very much, Mr. Wilkniss. Next David Kay from Southern California Edison.

MR. KAY: Good morning. I am David Kay, Environmental Specialist with Southern California Edison. 2244 Walnut Grove Avenue, Rosemead, California. In general Southern California Edison has been supportive of the underground tank regulations over the years since the original share bill, back in the '80s. We operate several hundred motor vehicle fuel tanks throughout our service territory. In general, the rules are good and necessary and do beautifully comply.

I am not here today to talk about those tanks.

What I want to discuss today are the 450 thousand gallon diesel underground storage tanks at the San Onofre nuclear generating station, which provide fuel for the emergency power generators at that facility. And those generators allow the nuclear plant to be brought down to a safe shutdown in the event of a total power loss on the grid.

The underground storage tank rules obviously were not intended for those tanks. They were intended for gasoline station tanks and other factory hazardous material underground storage tanks. It's been very difficult getting special consideration from our local agency for matters regarding compliance with these rules for those four tanks.

With all due respect to CUPA, San Diego county, and the sister agencies here. They have been very, very conservative in interpreting these rules to their credit, but to our detriment it has been very, very difficult and in some cases very, very expensive complying. Now, we are concerned that these under dispenser containment rules may cause, as it has in the past, a future heartache in terms of compliance, and in dealing with our CUPA.

There is a simple remedy for this, which perhaps we should have tried to get written into the original law back in the '80s, but we did not. And that was the change in the definition of motor vehicle fuel tank, as it currently appears in the regulations. I would suggest simply that we add to the definition for motor vehicle fuel tank.

This definition does not include underground tanks and piping serving emergency generators at nuclear fuel power plants regulated by the US Neutral Regulatory Commission. That exception would apply to only two facilities in California, San Onofre and PG&E's Diablo Canyon power plant. Alternatively, you could add specific exceptions to the under dispenser containment regulation.

For example, you could add a section 2636(H)(4). That would read on the order of under dispenser containment is not required for fuel delivery systems of emergency generators at nuclear fuel electric generating stations. Regulated by the Federal Nuclear Regulatory Commission. And similarly for the proposed regulations for enhanced leak detection, you would add a similar exemption, a new section 2640(f). That would read, the requirements of Section 2640(e) shall not apply to tank or fuel delivery systems of emergency generators at nuclear field electric generating stations regulated by the Federal Nuclear Regulatory Commission.

I know this sounds like a special exemption just for our facility. It is. This is not a corner gas station, and the tanks are not gasoline storage tanks. Nuclear Regulatory Commission imposes very, very strict requirements on Edison for the operation, maintenance and monitoring of those tanks. If the facility is designed to withstand a terrorist attack and a direct hit by a 747, certainly our underground storage tanks are protective of their environment.

Thank you for the opportunity to comment, and look forward to working with you in the future to draft these books.

MS. FARAHNAK: I have a question. I am very familiar with your facility, and I believe those are the tanks that there were discussions with --

MR. KAY: Yes. And they have been lined.

MS. FARAHNAK: Okay. I was curious. My understanding was these tanks were for the purpose of emergency generators, and you mentioned dispenser under dispenser plan?

MR. KAY: That's correct. They are hard piped to the diesel generators. There is no dispenser, such that you would see at a gasoline station.

MS. FARAHNAK: Okay. So that's why my question was in order for us to be able to respond to the comments, I wasn't sure how the under dispenser requirement would even apply to those facilities.

MR. KAY: Well, certainly, in my opinion, the under dispenser requirement would not apply to those facilities, but stranger things have happened in dealing with local agencies interpreting State regulations, particularly when the local agencies are given very little or no authority to grant exemptions or some wiggle room into the rules. And there is no formal process in the rule, or the law, for us to appeal a local agency decision to The State Board staff.

MS. FARAHNAK: I think it would be very helpful for me to respond to the comments, if you have a better idea as far as the dispensing part of your facility in order to -- if you provide The State Board with a better description of the design at your facility.

MR. KAY: You mean in terms of submitting these comments?

MS. FARAHNAK: Yes, later.

MR. KAY: As part of the comments.

MS. FARAHNAK: As part of the comments, or as a follow-up document, in order for us to evaluate that comment relating to dispenser containment docs. We need to have a better understanding of how your facility is put together.

MR. KAY: We would be happy to do that.

MR. NeSMITH: Constructive pressure diagram would be fine.

MR. KAY: Thank you.

MR. SILVA: Thank you, Mr. Kay. Next is James Weckerle, Pasadena Fire Department.

MR. WECKERLE: Thank you. My last name is Weckerle, W-e-c-k-e-r-l-e. I am with the Pasadena Fire Department. I'm the hazardous material specialist for our department. I ran all of our environmental programs. Well, it seems like much of the comments today has taken place regarding the materials involved in making tanks, and how we monitor those tanks.

It seems like we are missing a grand opportunity here today to solve one of the biggest problems that I see in the underground storage tank industry. Number one, performance indicator of an underground storage tank system is the quality of the installation and maintenance on that system.

What we see in the regulations today is a continuous in our reliance on the manufacturer's to train and certify the individuals involved in using their materials, and unfortunately that is not performed to a manner that I believe most regulators would have liked in the past, given the history of our underground storage tank tester program.

While there are many, many good testors out there, there are also many, many testers, who do not understand the equipment. Do not understand the limitations, and do not understand the regulations involved. They follow a checklist, and if the tank system that's involved doesn't fit the perimeters for which that tank checklist was developed, they miss the ball.

Similarly, the contractors license, while there are many, many good contractors out there, being in the fire prevention division of our fire department, I also see daily, contractors who do not understand what they are doing, and do not understand the regulations. And it causes problems for both the regulated community and the regulators.

We have an opportunity here to improve those programs, I believe, at least for those stations that are within a thousand feet of the public drinking water wells, if not the entire regulating community. I believe that The State Board needs to impose additional quality control and quality assurance matters or procedures on the training of these individuals, who will be installing and testing and maintaining these systems.

Manufacturer's training programs are necessary, but those training programs need to be monitored and approved by The State Board, so that we can ensure that there is some actual training going on; and there is some information transfer beyond merely here's a checklist, follow the checklist. Not all stations are cookie cutters.

Not all geology fits a certain profile. It's the exceptions and the exemptions and the differences that kill us. And if we have people who simply follow a checklist with no assurance that there is an actual information transfer and an understanding that goes along. We are fooling ourselves if we think that adding additional processes to monitor the equipment that we have in there is going to make a difference because where we see the leaks is not related to material failure.

Where we see leaks are due to workmanship problems. Typically, on the installation and typically on the maintenance. And your regulations do not address those issues. If you have any questions, I'd be happy to answer them. Thank you.

MR. SILVA: Thank you. I appreciate your comments. The last blue card is for Carl S. Joberg, L.A. County Department of Public Works.

MR. JOBERG: My name is Carl Joberg with Los Angeles County Department of Public Works. I wasn't originally going to make comments, but since I've heard a few things from comments from the other people that were here. I originally wasn't going to comment on the dispenser issue, but when the gentleman from Edison brought it up, I went back and looked at it and remembered I did have a problem with it.

In that we do have a lot of installations for generators that go directly where the system pumps up to a day tank or maybe directly to the equipment and so forth, where there isn't a dispenser per se. There is no make or break connection to the vehicle or device that is receiving the product. Traditionally, these hav been not even addressed, at least in our jurisdiction as dispensers.

I am not sure that the definition as you have it in here would necessarily exempt these things. We also have installations of non-motor vehicle fuel tanks. And in the urban area here, we've quite a few of those, where the product is delivered to some process within a building and so forth.

I think that I'm going to look at that definition, where we have direct connections to some equipment using the product or whatever, where is invisible in a work area, and this sort of thing, where we might want to exempt that.

The other comments that I have primary deal with the enhanced monitoring. I know that this is a difficult thing to deal with because of the language in the law itself, and perhaps that's true about this entire array. So you're kind of hand strong, and I appreciate your efforts here to try to get around it, but I have a little problem with the sole source issue, particularly because there really isn't a .05 standard of protocol for testing these methods.

Because it's a proprietary method it's difficult, plus the fact that it takes place over several days' time. It's difficult for an agency to verify what's going on. I think you're also going to have problems with it because even though vent piping and the single wall piping portions of the system are exempt from the need to do this enhanced testing, I don't know that you can get in there, and actually isolate those things. So if there are leaks in that system, the tracer-type test, and those who use that technology, are going to show a leak in that system, and then you're not going to know where it is coming from.

The other issue is with regard to approving these systems, where these people are required to submit to us; obviously, we don't know how many we are going to deal with yet because the match up hasn't been made in the database that we furnished to the Board. And I am not sure when we can expect that, but we are going to need some additional capacity in our database, and so forth, in order to react to this.

So as soon as possible that we can receive information, and exactly what kind of information is going to need to be captured, and how we are going to have to report back to The Board, if at all. We need to know so we can start making plans for our system.

Also I have a little bit of a problem in the secondary containment testing and annual maintenance certification Section 2637(a), where you're asking for an additional test six months after the installation, and 36 months after. And I read in your statement and reasons why you came up with that, I am not sure I agree with that. I think that imposes another inspection, another thing we have to track. That is going to be difficult to do because of the six-month time interval.

We are lucky if we get certifications and all the paperwork in within six months when something is first installed; let alone having to go back out there and get additional tester people.

The other issue I have is with the 48 hour notification of the local agency requirement for all these various test people are going to do and things they are going to do, and it appears in several places in here. Forty-eight hours we get these notifications now, and we say okay fine, and that notification gets tossed in the file, but there are occasions when we do want to observe a test.

And this has come about because of some of the recent expanded inspections that we've been making at some selected sites. And we want to have the ability to override this 48-hour notice business, or whatever time interval. If we feel the need for us to accompany a tester, or a certifier, or somebody, to a site, we want to have the ability to reset that schedule.

So we don't want people to just announce, "Well, in 48 hours from now we are going to be at "X" place." And we have to rearrange our schedule, and given the size of our operation and the number of tanks that we have to regulate, we want to have the ability for cause, or for some protocol, or some mechanism to extend that period to seek the schedules, that we are employees and our work schedules and things we've already planned and the regulation.

The last thing that I had a comment on is this whole issue of under dispenser containment, the ability to test these things. One of the things we found in these enhanced inspections, where we've actually asked people to dig things up, is that we are finding components that were installed and inspected during installation most likely, but they are not inspectable after you install the tanks.

Particularly, I'm talking about flexible couplings, hose clamps, and these source of things that get buried underneath the device. I don't know that there is any real standard for this equipment. Now, we know some manufacturers furnish the clamps with the package that they purchase on the entire containment system, but we don't know that that is a requirement, and we don't know that there is any standard for these things.

There is a lot of different kinds of hose clamps out there. There is a lot of different types of materials that are used for flexible coupling, and how long they will survive buried in the ground, we are not so sure. I don't think any of that can be tested or verified once it's installed.

I think since we are talking about a system of state listing of these devices, in the future I think those components that are buried and can't be observed through visual inspection need to have a very hard look at them as to their survivability and what their life span is.

MR. NeSMITH: Regarding a 48-hour notification of local agency, are you suggesting we extend it beyond 48, or rearrange it so that they ask you when they can perform that activity.

MR. JOBERG: Well, normally, we would waive the requirement, and traditionally we've done that. But there are occasions when we don't want to waive it, and 48 hours is a little bit of a short fuse. I think that -- I don't have a problem with leaving the 48-hour requirement in there, I just think there needs to be a provision whereby the local agency has the authority to say, "No. We want to set a specific date and time to do that."

MR. NeSMITH: Okay.

MR. SILVA: Thank you. We've got two more speakers. There is Jim Smith, San Bernardino County Fire.

MR. SMITH: Good morning. I am Jim Smith, San Bernardino County Fire, also representing California Cooper Farm. Just a couple of quick comments. One has to do annual inspections that you pointed out as amendment package and regulations. Our comment on the annual inspections that are required under this SB 989, is that we need a standard for what an inspection is, and that The State of the California and the Water Board has provided us with information on what they feel is an adequate inspection technique.

We don't disagree with that. We do disagree with the fact that we won't be able to get to all these facilities and be able to do that. We are not, due to risk management and whatnot able to allow our inspectors in the field to go out and do a lot of the hands on inspecting that you've asked for.

We try to go out when there is people that come out to do their annual certification, and go along with them and get our inspection done at that time. And that works fairly well; however, that's a scheduling problem in a large county such as mine, or Los Angeles, San Diego, Orange County, other places. Small cities can sometimes get to that, but it is a problem, and we've given you some written comments on that.

Secondly, on the enhance leak detection issue. Certainly, we feel that those areas that are within reasonable proximity, close proximity to drinking water wells, need to be watched and studied, and that drinking water is incredibly important to all of us.

Our county has greater than 90 percent of its drinking water supply comes from underground. And we have several locations where we have rather relatively high ground water. On the enhance leak detection issue, we don't understand why they would take a system that they have third party approval for to be a leak detection monitoring system on an annual basis, and as an enhanced system, only do it every three years.

I am not trying to make a fortune for Tracer Tech Technology, and I certainly stand with everyone else that the more companies that can do some type of enhance system, the better it is for everyone. But I also believe that if this is a critical issue, that it needs to be done on an annual basis, not every three years.

On dispenser containment. On the monitoring of dispenser containment, there is question that's been brought up about the regulations saying they need to be audible and visible. The monitoring, does the fact that the pump shuts down, does that meet that requirement? One of the problems that we have with the float systems that are in these dispenser containment tanks, is that unless they have extremely good housekeeping at the facility, the float systems tend to have changed, they break or are improperly adjusted, or that they fill up with filters that might sit on the float, so it won't actuate. Or there is just trash, garbage, debris, dirt in there that the floats don't work.

On the inspection that we go to, there is a good 40 percent of them that the floats aren't functioning properly in those dispensers. That brings us to the other side of what we do, and that is a fire hazard. If you have a containment system that is that close to vehicle traffic and people, persons's traffic and you have them filled with gasoline, you have yourself an extremely high fire hazard.

And so we like the idea that the monitoring system should be audible and visible. We like the idea that that monitoring system should be loud enough that something is done about it immediately, and we like the idea that that monitoring system when it goes in an alarm, shuts the product flow down, so that something needs to be done.

If you have shear valve trip valve in a three compartment containment box, one of those dispensers is leaking, and that shuts down the premium grade of fuel because that shear valve trips, and hasn't filled up to fill the other two, I'm still going to account for that pump to be pumping his gas, and taking his risk because there is gasoline sitting in that containment system.

On secondary containment testing, they mention -- well, our company says that visual is good enough, fine. We will let you do visual, but you're going to have to get that box up out of ground, so we can look at the bottom of it; however, secondary containment, we feel is incredibly important to test the secondary containment system.

There is a fact that whatever monitoring systems we put in there, whatever we've done on the secondary containment is based on the fact that that secondary containment is there and functioning. We could put the fanciest monitoring systems in the world to the secondary containment, but if there is a hole on the side and the product continues to leak out, we'll think we've got no problems.

But we might be contributing to contaminating the environment, due to the fact we assumed there's no problem here. That's why the secondary containment issue was brought forward. That's why we feel it's important. Secondly, on secondary containment systems, when you talk about dispenser containment boxes, Carl brought forward that underneath one of those systems there are buried components that you can't see.

At least if you pressure test the secondary containment piping system, whatever those flexible boots and connectors under there, will be tested at that time. And you will have some idea, whether or not, they are sound, and they are still there. As far as installation certification goes, in my 18 years of doing this job and underground storage tanks, I've seen almost every mistake that can conceivably be made. They continue to happen on a daily basis to companies that have been in business for a long time.

There is a high turnover of personnel in this industry, and we feel that whatever education that we can get for these people so they will be properly prepared and able to do the job, is better for everyone. The guy that owns the gas station, the guy that is trying to monitor the gas station, and those of us that have to regulate that gas station.

We have certainly met a large number of people that go out to do annual certification inspection, and they have no training, just whoever they are. Anyone here at this Board can go out to Joe's gas station punch the test button, and write him a certificate saying, "I came and checked your system. It worked the way it was supposed to." So there you go.

We think that if you're going to have these systems in place that we need to have some kind of verification, some kind of insurance that they are working. If we don't test these systems, if we don't follow through on this, then we might as well not put them in the ground. Thank you.

MR. SILVA: Next speaker is Mr. James White, White Environmental Services.

MR. WHITE: For the record my name is Jim White. I'm the principal with White Environment Association, Brea, California. I have been associated with the California and federal tank programs from the start, beginning with legislation. I work very diligently on behalf of the major oil company to affect some of the regulations that we are now looking to amend.

Given that background, I have to support the overall approach that has been taken, not only by SB 989, but also by the Water Board; however, I do have some very serious concerns. One happens to be perhaps a little bit outside the scope of this hearing, but I think it merits bringing it up. As many of you know, we have 107 different agencies out there that are very antonymous.

They don't report to anybody, but their own local governing agencies or governing bodies, and there is a whole lot of inconsistency, interpreted problems, and I understand that the Water Board has issued the LG letters to kind of bring more consistency and my hat's off to them for that.

However, over the past couple of years there

have been some studies and investigations and an audit that has shown that many of these agencies are not doing an adequate job. And this has been very well documented. And I guess I am very concerned, that although you don't have any authority over these local agencies, this is your program. And I am wondering perhaps there is something more that the Water Board can do to bring more pressure on these agencies to enforce.

My view of these more stringent regulations is, that at least a portion of them, are as a result of inadequate enforcement. So I think we need to do more to bring more pressure on the governing bodies. And I've got to tell you, I've visited about 24, 25 various local implementing agencies here in southern California and northern California, and they are sincere.

Most of them really want to do a good job. They are finding it very difficult to get the resources to do it. And I think you heard a little bit about some of the frustrations they've had before. So just a general comment, maybe there is more of a way we can bring greater pressure to some of these local implementing agencies to more consistently enforce this program.

I did want to comment, specifically, on the enhance leak detection. As you know, I did some written comments on this. This need, perceived need for enhance leak detection, in my view, and I think you may share this view, is due to some studies that have been done, relative to the adequacy and effectiveness of the current leak detection equipment. And I know one of your staff members specifically worked on a study regarding this.

I just want to caution you that in both of the studies that I am thinking of, I am thinking of the Water Board study, and the one that was done by U.C. Davis, Dr. Young and Mr. Couch. Both of those studies do refer to leak detectors that have been disconnected, leak detectors -- alarms that have been disabled, so on and so forth.

As a possible problem leading up to the ineffectiveness of leak detectors. And given this, and we are not able to quantify this because we had no specific physical forensic investigation of these UST sites as you know, but given this big uncertainty, I think there is some justification to perhaps forestall the promulgation of this enhance leak detection to take a further look, number one, at the effectiveness of this sole source of technology that is available right now because there is very little information about that. And to look at the availability of other options. And with that -- Chuck?

MR. NeSMITH: Regarding to your written comments, you're referring to the written comments you submitted --

MR. WHITE: On the original.

MR. NeSMITH: Yeah. Please resubmit it, we didn't have those, or I can just go ahead and consider those comments as being submitted now.

MR. WHITE: Okay. I certainly will.

MR. SILVA: Thank you.

MR. WHITE: Thank you.

MR. SILVA: Mr. Stan Brodecki, SPC.

MR. BRODECKI: I am Stan Brodecki. I work for SPC, which is the parent company of PacBell, Southwestern Bell, Meritech, and Southern New England Bell about 13 states. And I am in San Ramon, California. And I have about six to eight hundred underground storage tanks, only which about 100 of them contain gasoline, and I understand the dispenser requirement for the gasoline tanks.

And the way I've read the regulations and have read it for many years is that emergency generators because they don't have dispensers cannot have a dispenser tank. It's just not there. It won't fit. So I assumed that that was already not applicable to emergency generators!

I do have a question on the secondary testing, and it's a little bit of gray area for me, and I understand we can test the secondary containment of the piping. And we can probably test the sumps, by maybe fill them with water, et cetera, but the secondary containment of say a double wall steel or fiberglass tank that is full of product, is kind of hard to test. In the fact that you can't put a pressure test on it because you've got product in the tank.

And even if you were to remove all the product from the tank you'd have to thoroughly clean it, especially it's gasoline before you want to put any pressure 'cause you got a gigantic bomb sitting there. So you're looking at trying to test the secondary containment of the tank that has product in it, and you can't put pressure.

And about the only method I can think of right now would be possibly vacuum to the secondary containment. And I don't know of a particular testing company myself that can pull a vacuum on the secondary containment that has gone through third party certification for the point one gallon per hour plus the 95 percent rule, but if you guys know of one I'd appreciate that, but I am concerned on how we are actually going to test the secondary containment of the UST itself, not the piping or anything else.

And then of course, you also say that in five years, I have to make this system testable, if I use enhance leak detection plan, so but then again without having removed the tank we're putting something totally different. How am I going to do that.

MR. SILVA: Thank you. That's the last of the speakers. Let's again, anybody else that wishes to speak today, please if you are interested do it now, since we are going to close the hearing. Seeing nobody, what I'd like to do is have the staff go through --

MR. ROCK: I'd like to make one additional comment on this latest comment.

MR. SILVA: Would you restate your name.

MR. ROCK: Dennis Rock, Dennis Rock construction. It's a little bias view because I am a contractor. You have listed in here one, two, three, four, four possible -- five types of contractor licenses that are necessary to work, with the fifth being the C-61 D-40.

What you have not listed in here is that we as contractors also must have a hazardous material certificate attached to our license to work on any underground tank system. That involves removal, installation, piping, piping repairs, monitoring certifications installed, any of that. That's a tank system. We do not get involved in tank testing. That's a separate license that this gentleman has or this company has.

As a contractor, we have to stand behind our product. We work on your tanks, by law we have to have liability insurance, a bond, now we have to have also pollution insurance, and we have to stand behind the work for ten years. That's why we need contractors doing this work. If you are not licensed, and you don't want to stand behind the product, then get into another business. Thank you.

MR. SILVA: Thank you, Mr. Rock. What I'd like to do now is let the staff just go over briefly through what happens next in the process.

MS. HAVEN: Thank you. The next step will be that we will review the comments that we've received today, and those that are requesting changes in the regulations, we will address in writing in a written response to comments documents that will be available from us, and we will also make sure that is posted on our internet site. If anyone needs that address you can see me after or see any of the staff people after this section is over.

I'd like to thank you all for your comments here today. We do expect that we will have a 15-day comment period after this. And the process is that we are gathering comments today on all aspects of regulations that are proposed. We will choose to make some changes. We believe at this point we'll be modifying portions of the regulations.

Those portions of the regulations that are changed will then be available for comments again, and that information will be on our Website and also if you're interested in receiving written notification of that, you can see us here today.

Thank you all, and thank you Mr. Silva for presiding.

MR. SILVA: Thank you. Again, before I close the hearing, I just want to let you know the staff will stick around. Since we finished early, if you want to chat with the staff, please free feel to do so. It won't be formal anymore, but at least you can share some ideas with them. I also want to thank you on your excellent comments today. Public hearing is closed. Thank you.

* * *

(The hearing proceedings were concluded at 11:35 A.M.)

STATE OF CALIFORNIA

I, Silvia D. Giddis, CSR No. 12014, a Certified Shorthand Reporter in and for the State of California, do hereby certify:

That the foregoing proceedings were taken down by me in shorthand at the time and place named therein and were thereafter transcribed under my supervision; that this transcript contains a full, true and correct record of the proceedings which took place at the time and place set forth in the caption hereto.

I further certify that I have no interest in the event of the action.

EXECUTED this 27th day of July, 2000.

Silvia D. Giddis

VIII. POST NOTICE MODIFICATION TO TEXT (including full text and SOR)

A. NOVEMBER 22 TO DECEMBER 11, 2000

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

STATEMENT OF MAILING NOTICE
(Pursuant to Section 44 of Title 1 of the California Code of Regulations)

The State Water Resources Control Board (SWRCB) has complied with the provisions of Government Code section 11346.8(c) regarding the public notification of changes to proposed regulations. The notification was mailed on **November 22, 2000.** The public comment period began on **November 22, 2000** and ended **January 8, 2001 (20 days).**

Dated: November 22, 2000

By: Chris M Smith

Title : Assoc. Engineering Geologist

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

November 22, 2000

NOTICE OF MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

Pursuant to the requirements of Government Code section 11346.8(c), and section 44 of Title 1 of the California Code of Regulations, the State Water Resources Control Board (SWRCB) is providing notice of changes made to proposed regulations to implement Senate Bill 989 that were the subject of a regulatory hearing on July 18, 2000. In addition to changes made to the proposed text, amendments were also made to the original text of Chapter 16 in order to accommodate the the changes made to the SB 989 regulations. All of the changes are either in response to comments received regarding the proposed SB 989 regulations, or initiated by the SWRCB.

The text of the proposed regulations, including all changes, and the statement of reasons for the changes, are attached. Regulatory language is identified as follows:

1. The original text of Chapter 16 is in light typeface

2. The proposed regulations to implement SB 989 are in either bold strikeout or bold underline typeface

3. New changes to original text are in shaded typeface, or shaded strikeout typeface

4. Changes made to the proposed regulations to implement SB 989 are in either bold shaded underline, or bold shaded strikeout.

The SWRCB will accept written comments regarding the changes made to the proposed SB 989 regulations, and additional amendments to Chapter 16 to accommodate those changes. All written comments must be submitted to the SWRCB no later than 5:00 p.m. on December 11, 2000 and addressed to:

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA, 94244-2120
Attn: Charles NeSmith

All written comments received by December 11, 2000 that pertain to the indicated changes will be reviewed and responded to by the SWRCB staff as part of the compilation of the rulemaking file. Please limit your comments to revisions of the proposed SB 989 regulations, and changes in the original text to accommodate those revisions.

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

November 22, 2000

MODIFICATIONS OF PROPOSED TEXT OF REGULATIONS

Amend Title 23, Division 3, Chapter 16, Article 1, section 2611 of the California Code of Regulations to read as follows:

2611. Additional Definitions

Unless the context requires otherwise, the following definitions shall apply to terms used in this chapter.

"Bladder system" means a flexible or rigid material which provides primary containment including an interstitial monitoring system designed to be installed inside an existing underground storage tank.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. The term includes only persons who have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"Coatings expert" means a person who, by reason of thorough training, knowledge, and experience in the coating of metal surfaces, is qualified to engage in the practice of internal tank lining inspections. The term includes only those persons who are independent of any lining manufacturer or applicator and have no financial interest in the tank or tanks being monitored.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which hazardous substances flow. For the purpose of determining how much piping is connected to any individual underground storage tank system, the piping that joins two underground storage tank systems should be allocated equally between them.

"Continuous monitoring" means a system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

"Dispenser" means an aboveground or underground ~~device connected to underground storage tank piping~~ that is used for the delivery of a hazardous substance from the underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.

~~"Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.~~

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

"Heating oil tank" means a tank located on a farm or at a personal residence and which holds no more than 1,100 gallons of home heating oil which is used consumptively at the premises where the tank is located.

"Holiday," when used with respect to underground storage tank coating or cladding, means a pinhole or void in a protective coating or cladding.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Inconclusive" means the conclusion of a statistical inventory reconciliation report that is not decisive as to whether a release has been detected.

"Independent testing organization" means an organization which tests products or systems for compliance with voluntary consensus standards. To be acceptable as an independent testing organization, the organization shall not be owned or controlled by any client, industrial organization, or any other person or institution with a financial interest in the product or system being tested. For an organization to certify, list, or label products or systems in compliance with voluntary consensus standards, it shall maintain formal periodic inspections of production of products or systems to ensure that a listed, certified, or labeled product or system continues to meet the appropriate standards.

"Independent third party" means independent testing organizations, consulting firms, test laboratories, not-for-profit research organizations and educational institutions with no financial interest in the matters under consideration. The term includes only those organizations which are not owned or controlled by any client, industrial organization, or any other institution with a financial interest in the matter under consideration.

"Integral secondary containment" means a secondary containment system manufactured as part of the underground storage tank.

"Interstitial space" means the space between the primary and secondary containment systems.

"Leak threshold" means the value against which test measurements are compared and which serves as the basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate.

"Liquid asphalt tank" means an underground storage tank which contains steam-refined asphalts.

"Liquefied petroleum gas tank" means an underground storage tank which contains normal butane, isobutane, propane, or butylene (including isomers) or mixtures composed predominantly thereof in a liquid or gaseous state having a vapor pressure in excess of 40 pounds per square inch absolute at a temperature of 100 degrees Fahrenheit.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing hazardous substances.

"Manufacturer" means any business which produces any item discussed in these regulations.

"Manual inventory reconciliation" means a procedure for determining whether an underground tank system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. This term does not include procedures which are based on statistical inventory reconciliation.

"Membrane liner" means any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored.

"Membrane liner fabricator" means any company which converts a membrane liner into a system for secondary containment.

"Membrane manufacturer" means any company which processes the constituent polymers into membrane sheeting from which the membrane liner is fabricated into a system for secondary containment.

"Motor vehicle" means a self-propelled device by which any person or property may be propelled, moved, or drawn.

"Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil.

"New underground storage tank" means an underground storage tank which is not an existing underground storage tank.

"Non-volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and consideration of circumstances and physical phenomena internal or external to the tank.

"Operational life" means the period beginning when installation of the tank system has begun until the time the tank system should be properly closed.

"Operator" means any person in control of, or having responsibility for, the daily operation of an underground storage tank system.

"Person", as defined in Chapter 6.7 of Division 20 of the Health and Safety Code includes any entity defined as a person under the Federal Act.

"Perennial ground water" means ground water that is present throughout the year.

"Petroleum" means petroleum including crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.

"Pipeline leak detector" means a continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less.

"Probability of detection" means the likelihood, expressed as a percentage, that a test method will correctly identify a leaking underground storage tank.

"Probability of false alarm" means the likelihood, expressed as a percentage, that a test method will incorrectly identify a "tight" tank as a leaking underground storage tank.

"Qualitative release detection method" means a method which detects the presence of a hazardous substance or suitable tracer outside the underground storage tank being tested.

"Quantitative release detection method" means a method which determines the integrity of an underground storage tank by measuring a release rate or by determining if a release exceeds a specific rate.

"Release detection method or system" means a method or system used to determine whether a release of a hazardous substance has occurred from an underground tank system into the environment or into the interstitial space between an underground tank system and its secondary containment.

"Repair" means to restore a tank or underground storage tank system component that has caused a release of a hazardous substance from the underground storage tank system.

"Septic tank" means a tank designed and used to receive and process biological waste and sewage.

~~"Spill containment or control system" means a device that is capable of preventing an unauthorized release from the dispenser from entering the soil or groundwater or both.~~

"Statistical inventory reconciliation" means a procedure to determine whether a tank is leaking based on the statistical analysis of measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically.

"Statistical inventory reconciliation provider" means the developer of a statistical inventory reconciliation method that meets federal and state standards as evidenced by a third-party evaluation conducted according to section 2643(f), or an entity that has been trained and certified by the developer of the method to be used. In either case, the provider shall have no direct or indirect financial interest in the underground storage tank being monitored.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment

is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Substantially beneath the surface of the ground" means that at least 10 percent of the underground tank system volume, including the volume of any connected piping, is below the ground surface or enclosed below earthen materials.

"Sump," "pit," "pond," or "lagoon" means a depression in the ground which lacks independent structural integrity and depends on surrounding earthen material for structural support of fluid containment.

"Tank integrity test" means a test method that can ascertain the physical integrity of an underground storage tank. The term includes only test methods which are able to detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of 5 percent or less. The test method may be either volumetric or non-volumetric in nature. A leak rate is reported using a volumetric test method, whereas, a non-volumetric test method reports whether a substance or physical phenomenon is detected which may indicate the presence of a leak.

"Unauthorized release" as defined in Chapter 6.7 of Division 20 of the Health and Safety Code does not include intentional withdrawals of hazardous substances for the purpose of legitimate sale, use, or disposal.

"Under-Dispenser Containment" means secondary containment that is located under a dispenser.

"Under-Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of hazardous substances.

"Upgrade compliance certificate" includes a numbered decal, file copy of the decal, and plastic fill pipe tag as described in Section 2712.1 of these regulations.

"Volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and comparison of tank volume.

"Voluntary consensus standards" means standards that shall be developed after all persons with a direct and material interest have had a right to express a viewpoint and, if dissatisfied, to appeal at any point (a partial list of the organizations that adopt voluntary consensus standards are shown in Appendix I, Table B).

"Wastewater treatment tank" means a tank designed to treat influent wastewater through physical, chemical, or biological methods and which is located inside a public or private wastewater treatment facility. The term includes untreated wastewater holding tanks, oil water separators, clarifiers, sludge

holding tanks, filtration tanks, and clarified water tanks that do not continuously contain hazardous substances.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25282, 25283, 25284, **25284.1**, 25292.3 and 25299.5(a), Health and Safety Code; 40 CFR 280.10 and 280.12.

Amend Title 23, Division 3, Chapter 16, Article 3, existing sections 2630, 2631, 2635, and 2636 of the California Code of Regulations to read as follows:

2630. General Applicability of Article

(a) The requirements in this article apply to owners of new underground storage tanks. ~~**Underground storage tanks installed after January 1, 1984, may be deemed to be in compliance with the requirements in this article if they were installed in accordance with federal and state requirements that existed at the time of installation. However**~~ **In addition**, the applicable repair and upgrade requirements in Article 6 shall be complied with.

(b) Sections 2631 and 2632 specify design, construction, and monitoring requirements for all new underground storage tanks. **Sections 2633 and 2634 specify alternate design, construction, and monitoring requirements, in lieu of those specified in sections 2631 and 2632, for underground storage tanks installed before January 1, 1997 which store only motor vehicle fuel.** ~~**New**~~ **Uunderground storage tanks** ~~**which store only motor vehicle fuels may be**~~ **constructed** ~~**and monitored**~~ **pursuant to the requirements specified in sections 2633** ~~**and 2634**~~ **in lieu of those specified in sections 2631** ~~**and 2632. However, if the tank is constructed according to requirements in section 2633 the monitoring requirements of section 2634 shall also be met.**~~ **shall be monitored in accordance with section 2634.**

(c) All new underground storage tanks, piping, and secondary containment systems shall comply with sections 2635 and 2636.

(d) All monitoring equipment used to satisfy the requirements of **this article** ~~**sections 2632, 2634, and 2636**~~ shall meet the requirements of section 2643(f) and shall be installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity. Additionally, all monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated, and maintained in accordance with **section 2637(b).** ~~**manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.**~~

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1,** 25291 and 25292.3, Health and Safety Code; 40 CFR 280.20.

2631. Design and Construction Requirements for New Underground Storage Tanks

(a) All new underground storage tanks including associated piping used for the storage of hazardous substances shall have primary and secondary of containment. Primary containment shall be product-tight. Secondary containment may be manufactured as an integral part of the primary containment or it may be constructed as a separate containment system. **Secondary containment systems shall be designed and constructed such that the secondary containment system can be periodically tested in accordance with section 2637(a).**

(b) The design and construction of all primary containment including any integral secondary containment system, shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. All other components used to construct the primary containment system, such as special accessories, fittings, coatings or linings, monitoring systems and level controls used to form the underground storage tank system shall also be approved by an independent testing organization. This requirement became effective on July 1, 1991 for underground storage tanks; January 1, 1992 for piping; and shall be effective on January 1, 1995 for all other components. The exterior surface of underground storage tanks shall bear a marking, code stamp, or label showing the following minimum information:

(1) Engineering standard used;
(2) Nominal diameter in feet;
(3) Nominal capacity in gallons;
(4) Degree of secondary containment;
(5) Useable capacity in gallons;
(6) Design pressure in psig;
(7) Maximum operating temperature in degrees Fahrenheit;
(8) Construction materials;
(9) Year manufactured; and
(10) Identity of manufacturer.

(c) A primary containment system with or without an integral secondary containment system shall have wear plates (striker plates) installed, center to center, below all accessible openings. The plates shall be made of steel or other appropriate material if steel is not compatible with the hazardous substance stored. The width of the plate shall be at least eight inches on each side, or shall be equal to the area of the accessible opening or guide tube, whichever is larger. The thickness of the steel plate shall be at least 1/8 inch and those made of other materials shall be of sufficient thickness to provide equivalent protection. The plate, if under 1/4 inch thick, shall be rolled to the contours of the underground storage tank and all plates shall be bonded or tack welded in place. A drop tube-mounted bottom protector may fulfill this requirement.

(d) A secondary containment system which is not an integral part of primary containment shall be designed and constructed according to an engineering specification approved by a state registered professional engineer or according to a nationally recognized industry code or engineering standard. The engineering specification shall include the construction procedures. Materials used to construct the secondary containment system shall have sufficient thickness, density, and corrosion resistance to prevent structural weakening or damage to the secondary containment system as a result of contact with any released hazardous substance. The following requirements apply to these secondary containment systems:

(1) The secondary containment system shall be constructed to contain at least the following volumes:

(A) One hundred percent of the usable capacity of the primary containment system where only one primary container is within the secondary containment system.

(B) In the case of multiple primary containers within a single secondary containment system, the secondary containment system shall be large enough to contain 150 percent of the volume of the largest primary container within it, or 10 percent of the aggregate internal volume of all primary containers within the secondary containment system, whichever is greater. When all primary containers are completely enclosed within the secondary containment system, the restrictions of this subsection do not apply.

(2) If the secondary containment system is open to rainfall, it shall be constructed to accommodate the volume of precipitation which could enter the secondary containment system during a 24-hour, 25-year storm in addition to the volume specified in subsection (d)(1).

(3) If backfill material is placed in the secondary containment system, the volumetric requirements for the pore space shall be equal to the requirement in subsection (d)(1). The available pore space in the secondary containment system backfill shall be determined using standard engineering methods and safety factors. The specific retention and specific yield of the backfill material, the location of any primary container within the secondary containment, and the proposed method of operation for the secondary containment system shall be considered in determining the available pore space.

(4) The secondary containment system shall be equipped with a collection system to accumulate, temporarily store, and permit removal of any liquid within the system.

(5) The floor of the secondary containment system shall be constructed on a firm base and, if necessary for monitoring, shall be sloped to a collection sump. One or more access casings shall be installed in the sump and sized to allow removal of collected liquid. The access casing shall extend to the ground surface, be perforated in the region of the sump, and be covered with a locked waterproof cap or enclosed in a surface security structure that will protect the access casing(s) from entry of surface water, accidental damage, unauthorized access, and vandalism. A facility with locked gates will satisfy the

requirements for protection against unauthorized access and vandalism. The casing shall have sufficient thickness to withstand all anticipated stresses with appropriate engineering safety factors and constructed of materials that will not be structurally weakened by the stored hazardous substance and will not donate, capture, or mask constituents for which analyses will be made.

(6) Secondary containment systems utilizing using membrane liners shall be approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. A membrane liner shall contain no primary nutrients or food-like substances attractive to rodents and shall meet the requirements in Table 3.1 after a 30-day immersion in the stored hazardous substance.

(7) A membrane liner, if used, shall be installed under the direct supervision of a representative of the membrane liner fabricator or a contractor certified by the fabricator.

(8) The excavation base and walls for a membrane liner shall be prepared to the membrane liner fabricator's specifications and shall be firm, smooth, and free of any sharp objects or protrusions.

(9) The site shall be assessed to ensure that the secondary containment is always above the ground water and not in a 25-year flood plain, unless the containment and monitoring designs are for use under such conditions.

(e) Laminated, coated, or clad materials shall be considered a single wall and do not fulfill the requirements of both primary and secondary containment.

(f) Underground storage tanks with integral secondary containment systems, which satisfy the construction requirements of subsection (b), fulfill the volumetric requirements for secondary containment specified in subsection (d)(1).

(g) Underground storage tanks with secondary containment systems shall be designed and installed so that any loss of a hazardous substance from the primary containment will be detected by an interstitial monitoring device or method.

(h) An underground storage tank which contains motor vehicle fuel and which is designed with an integral secondary containment system shall provide 100 percent secondary containment unless it is equipped with the overfill prevention system in accordance with section 2635(b)(2)(C). In this case, the top portion of the tank, no greater than two feet wide along the length of the tank, may be single-walled.

(i) Tanks designed and constructed pursuant to the provisions of this section shall be monitored according to the provisions of section 2632.

Authority cited: Sections 25299.3 and 25299.7 Health and Safety Code.
Reference: Sections 25281, **25284.1** and 25291, Health and Safety Code; 40 CFR 280.20.

2635. Installation and Testing Requirements for All New Underground Storage Tanks

(a) Primary and secondary containment systems shall be designed, constructed, tested, and certified to comply, as applicable, with all of the following requirements:

(1) All underground storage tanks shall be tested at the factory before being transported. The tests shall determine whether the tanks were constructed in accordance with the applicable sections of the industry code or engineering standard under which they were built.

(2) The outer surface of underground storage tanks constructed of steel shall be protected from corrosion as follows, except that primary containment systems installed in a secondary containment system and not backfilled do not need cathodic protection:

(A) Field-installed cathodic protection systems shall be designed and certified as adequate by a corrosion specialist. The cathodic protection systems shall be tested by a cathodic protection tester within six months of installation and at least every three years thereafter. The criteria that are used to determine that cathodic protection is adequate as required by this section shall be in accordance with a code of practice developed in accordance with voluntary consensus standards. Impressed-current cathodic protection systems shall also be inspected no less than every 60 calendar days to ensure that they are in proper working order.

(B) Underground storage tanks protected with fiberglass-reinforced plastic coatings, composites, or equivalent non-metallic exterior coatings or coverings, including coating/sacrificial anode systems, shall be tested at the installation site using an electric resistance holiday detector. All holidays detected shall be repaired and checked by a factory authorized repair service before installation. During and after installation, care shall be taken to prevent damage to the protective coating or cladding. Preengineered corrosion protection systems with sacrificial anodes shall be checked once every three years in accordance with the manufacturer's instructions.

(3) Before installation, the tank shall be tested for tightness at the installation site in accordance with the manufacturer's written guidelines. If there are no guidelines, the primary and secondary containment shall be tested for tightness with air pressure at not less than 3 pounds per square-inch (20.68 k Pa) and not more than 5 pounds per square-inch (34.48 k Pa). In lieu of the above, an equivalent differential pressure test, expressed in inches of mercury vacuum, in the interstitial space of the secondary containment, is acceptable. The pressure (or vacuum in the interstitial space) shall be maintained for a minimum of 30 minutes to determine if the tank is tight. If a tank fails the tightness test, as evidenced by soap bubbles, or water droplets, installation shall be suspended until the tank is

replaced or repaired by a factory authorized repair service. Following repair or replacement, the tank shall pass a tightness test.

(4) All secondary containment systems shall pass a post-installation test which meets the approval of the local agency.

(5) After installation, but before the underground storage tank is placed in service, a tank integrity test shall be conducted to ensure that no damage occurred during installation. The tank integrity test is not required if the tank is equipped with an interstitial monitor certified by a third-party evaluator to meet the performance standards of a "tank integrity test" as defined in section 2611, or if the tank is tested using another method deemed by the State Water Resources Control Board to be equivalent.

(6) All underground storage tanks shall be installed according to a code of practice developed in accordance with voluntary consensus standards and the manufacturer's written installation instructions. The owner or operator shall certify that the underground storage tank was installed in accordance with the above requirements as required by subsection (d) of this section.

(7) All underground storage tanks subject to flotation shall be anchored using methods specified by the manufacturer or, if none exist, shall be anchored according to the best engineering judgment.

(b) All underground storage tanks shall be equipped with a spill container and an overfill prevention system as follows:

(1) The spill container shall collect any hazardous substances spilled during product delivery operations to prevent the hazardous substance from entering the subsurface environment. The spill container shall meet the following requirements:

(A) If it is made of metal, the exterior wall shall be protected from galvanic corrosion.

(B) It shall have a minimum capacity of five gallons (19 liters).

(C) It shall have a drain valve which allows drainage of the collected spill into the primary container or provide a means to keep the spill container empty.

(2) The overfill prevention system shall not allow for manual override and shall meet one of the following requirements:

(A) Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or

(B) Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm sounds at least five minutes before the tank overfills; or

(C) Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or,

(D) Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

(3) The local agency may waive the requirement for overfill prevention equipment where the tank inlet exists in an observable area, the spill container is adequate to collect any overfill, and the tank system is filled by transfers of no more than 25 gallons at one time.

(c) Secondary containment systems including leak interception and detection systems installed pursuant to section 2633 shall comply with all of the following:

(1) The secondary containment system shall encompass the area within the system of vertical planes surrounding the exterior of the primary containment system. If backfill is placed between the primary and secondary containment systems, an evaluation shall be made of the maximum lateral spread of a point leak from the primary containment system over the vertical distance between the primary and secondary containment systems. The secondary containment system shall extend an additional distance beyond the vertical planes described above equal to the radius of the lateral spread plus one foot.

(2) The secondary containment system shall be capable of preventing the inflow of the highest ground water anticipated into the interstitial space during the life of the tank.

(3) If the interstitial space is backfilled, the backfill material shall not prevent the vertical movement of leakage from any part of the primary containment system.

(4) The secondary containment system with backfill material shall be designed and constructed to promote gravity drainage of an unauthorized release of hazardous substances from any part of the primary containment system to the monitoring location(s).

(5) Two or more primary containment systems shall not use the same secondary containment system if the primary containment systems store materials that in combination may cause a fire or explosion, or the production of a flammable, toxic, or poisonous gas, or the deterioration of any part of the primary or secondary containment system.

(6) Drainage of liquid from within a secondary containment system shall be controlled in a manner approved by the local agency to prevent hazardous materials from being discharged into the environment. The liquid shall be analyzed to determine the presence of any of the hazardous substance(s) stored in

the primary containment system prior to initial removal, and monthly thereafter, for any continuous discharge (removal) to determine the appropriate method for final disposal. The liquid shall be sampled and analyzed immediately upon any indication of an unauthorized release from the primary containment system.

(7) For primary containment systems installed completely beneath the ground surface, the original excavation for the secondary containment system shall have a water-tight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as water-tight as practical. Primary containment systems with integral secondary containment and open vaults are exempt from the requirements of this subsection.

(8) The actual location and orientation of the tanks and appurtenant piping systems shall be indicated on as-built drawings of the facility. Copies of all drawings, photographs, and plans shall be submitted to the local agency for approval.

(d) Owners or their agents shall certify that the installation of the tanks and piping meets the conditions in subdivisions (1) through (5) below. The certification shall be made on a "Certificate of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(1) The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers. **On and after July 1, 2001, t~~T~~his certification shall be renewed ~~every 36 months upon~~ by completion of refresher training provided by the manufacturer. Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.**

(2) The installer has been certified or licensed by the Contractors State License Board;

(3) The underground storage tank, any primary piping, and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions;

(4) All work listed in the manufacturer's installation checklist has been completed; and

(5) The installation has been inspected and approved by the local agency, or, if required by the local agency, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **<u>25284.1, 25291</u>** and 25299, Health and Safety Code; 40 CFR 280.40 - 280.45.

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping ~~and Under-dispenser Containment.~~

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems

shall be sloped so that all releases will flow to a collection sump located at the low point of the underground piping.

(2) Primary piping and secondary containment systems shall be installed in accordance with an industry code of practice developed in accordance with voluntary consensus standards. The owner or operator shall certify that the piping was installed in accordance with the above requirements of section 2635(d). The certification shall be made on the "Certification of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(d) Lined trench systems used as part of a secondary containment system shall be designed and constructed according to a code of practice or engineering standard approved by a state registered professional engineer. The following requirements shall also apply:

(1) All trench materials shall be compatible with the substance stored and evaluated by an independent testing organization for their compatibility or adequacy of the trench design, construction, and application.

(2) The trench shall be covered and capable of supporting any expected vehicular traffic.

(e) All new primary piping and secondary containment systems shall be tested for tightness after installation in accordance with manufacturer's guidelines. Primary pressurized piping shall be tested for tightness hydrostatically at 150 percent of design operating pressure or pneumatically at 110 percent of design operating pressure. If the calculated test pressure for pressurized piping is less than 40 psi, 40 psi shall be used as the test pressure. The pressure shall be maintained for a minimum of 30 minutes and all joints shall be soap tested. A failed test, as evidenced by the presence of bubbles, shall require appropriate repairs and retesting. If there are no manufacturer's guidelines, secondary containment systems shall be tested using an applicable method specified in an industry code or engineering standard. Suction piping and gravity flow piping which cannot be isolated from the tank shall be tested after installation in conjunction with an overfilled volumetric tank integrity test, or other test method meeting the requirements of section 2643(f), if approved by the local agency.

(f) Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems as follows:

(1) All ~~The~~ secondary containment, including under-dispenser containment, ~~system~~ shall be equipped with a continuous monitoring system that either activates ~~which meets the requirements of section 2643(f) and which is connected to~~ an audible and visual alarm ~~system~~ or stops the flow of product at the dispenser when it detects a leak.

(2) Automatic line leak detectors shall be installed on underground pressurized piping and shall be capable of detecting a 3-gallon per hour leak rate at 10 psi within 1 hour with a probability of detection of at least 95 percent and a probability of false alarm no greater than 5 percent. ~~Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.~~

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section. ~~A~~ Ccontinuous monitoring systems as described in subdivision (1), which shuts down the pump in addition to either activating the audible and visual alarm system or stopping the flow of product at the dispenser, satisfyies the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure of the product piping system at the test pressure with at least a 95 percent probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) All ~~The~~ secondary containment systems ~~is~~ are equipped with ~~a~~ continuous monitoring systems. The leak detection device may be located at the pump sump for sections of ~~if~~ the piping that slopes back to this point.

(2) All ~~A~~ continuous monitoring systems ~~is~~ for the piping are connected to ~~an audible and visual alarm system and~~ the pumping system.

(3) All ~~A~~ continuous monitoring systems for the piping shuts down the pump and either activates an audible and visual the alarm system or stop the flow of product at the dispenser when they detect a leak ~~a release is detected~~.

(4) The pumping system shuts down automatically if any of the continuous monitoring systems for the piping fail or are ~~is~~ disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:

(1) Owners or Operators of a UST system shall have the system fitted with under-dispenser containment, or an approved dispenser spill containment or control system according to the following schedule:

(A) At the time of installation for systems installed after January 1, 2000.

(B) By July 1, 2001, for systems installed after July 1, 1987 that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state ~~notified by the board according to its~~ Geographic Information System mapping database.

(C) By December 31, 2003, for systems not subject to subsection 2636(h)(1)(A) or (B).

(2) Under-dispenser containment ~~must~~ shall be designed, constructed, installed, and monitored in accordance with section 2631, 2636(c)(2), 2636(e), and 2636(f). ~~Separate monitoring for under-dispenser containment is not required if the lowest point of the under-dispenser containment drains to a monitoring point within the connected piping system.~~

(3) A manufacturer of a dispenser spill containment or control system may apply to the Division of Clean Water Programs Underground Storage Tank Program Manager for approval of the system. Owners or operators shall not install a dispenser spill containment or control system that has not been approved.

(A) Applications for approval shall be submitted in writing and include the following:

(i) A description of the proposed system.

(ii) Clear and convincing evidence that the system will protect the soil and beneficial uses of the waters of the state from unauthorized releases.

(B) The Program Manager shall review the application to determine if the proposed system adequately protects the soil and beneficial uses of groundwater before determining whether to approve the proposed system.

(C) The Program Manager may modify or revoke a previously issued approval if it finds that, based on new evidence, the approved system does not adequately protect the soil and beneficial uses of groundwater from unauthorized releases.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1**, 25291 and 25299, Health and Safety Code; 40 CFR 280.20, 280.40-280.45.

Amend Title 23, Division 3, Chapter 16, Article 3, to add new sections 2636.1, 2636.2, 2636.3, 2636.4 and 2637 of the California Code of Regulations as follows:

2636.1. Final Division Decisions Regarding Dispenser Spill Containment or Control Systems

(a) **A manufacturer of a dispenser spill containment or control system who disagrees with a determination by the Program Manager not to approve the manufacturer's system under section 2636(h)(3)(B) or to modify or revoke a previously issued approval of the manufacturer's system under section 2636(h)(3)(C) may ask for a review by the Division Chief.**

(b) **An appeal to the Division Chief must be in writing and must be accompanied by all material that the manufacturer wishes to be considered by the Division Chief, and by the Board in any subsequent review by the Board. The appeal must contain an explanation why the manufacturer believes the Program Manager's determination is erroneous, inappropriate, or improper.**

(c) **The Division Chief shall render a Final Division Decision within 30 days of receipt of the appeal. A Final Division Decision is final and conclusive unless the manufacturer files a petition for review with the Board that is received by the Board within 30 days from the date of the Final Division Decision.**

(d) **The Division Chief may at any time, on the Division Chief's own motion, issue a Final Division Decision.**

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.2. Petition for Board Review Regarding Dispenser Spill Containment or Control Systems

(a) A manufacturer may petition the Board for review of a Final Division Decision.

(b) A petition for Board review shall contain the following:

(1) The name and address of the petitioner;

(2) A statement of the date on which the petitioner received the Division's final decision;

(3) A copy of the Final Division Decision that the Board is requested to review;

(4) An explanation why the petitioner believes the Final Division Decision is erroneous, inappropriate, or improper;

(5) A statement describing how the petitioner is damaged by the Final Division Decision; and

(6) A description of the remedy or outcome desired.

(c) The petition shall be sent to the Board Chairperson, with copies sent to the Chief Counsel of the Board, and the Division Chief.

(d) The petitioner may request a hearing for the purpose of presenting factual material not presented to the Division Chief or for oral argument or both. The request to present material that was not presented to the Division Chief must include a description of the factual material that the petitioner wishes to submit, the facts that the petitioner expects to establish, and an explanation of the reasons why the petitioner could not previously submit the new material to the Division Chief. The petitioner must include with the petition a copy of any new documentary material that the petitioner wishes to present to the Board.

(e) The Division Chief may file a response to the petition with the Board within 30 days of the Board's notification to the petitioner that the petition is complete. The Division must provide a copy of any response to the petitioner. The Board may extend the time for filing a response by the Division Chief.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.3. Defective Petitions

Upon the Board's receipt of a petition which does not comply with section 2636.2 of this chapter, the Board, through its Chief Counsel, will advise the petitioner of the manner in which the petition is defective and allow a reasonable time within which an amended petition may be filed. If the Board does not receive a properly amended petition within the time allowed, the petition shall be dismissed.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.4. Action by the Board Regarding Spill Containment or Control Systems

(a) In response to the petition, the Board may:

(1) Refuse to review the petition if it is late or fails to raise substantial issues that are appropriate for Board review;

(2) Affirm the final decision that the Board has been requested to review;

(3) Set aside or modify the final decision that the Board has been requested to review; or

(4) Take such other action as the Board deems appropriate.

(b) Before taking action, the Board may, at its discretion, hold a hearing, or provide for an informal meeting between the petitioner, the Division Chief, a member of the Board, and such other persons as the Board deems appropriate for the purpose of attempting to resolve the dispute.

(c) If an evidentiary hearing is held, it shall be conducted in accordance with the California Code of Regulations, title 23, division 3, Chapter 1.5, article 2.

(d) The Board reserves the right, at its discretion, to consider a petition upon its own motion.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2637. Secondary Containment Testing and Annual Maintenance Certification

(a) Secondary containment systems installed ~~o~~On or after January 1, 2001 ~~all secondary containment of underground storage tank systems, including, but not limited to, open secondary containment, lined trench systems, under-dispenser containment, and sumps,~~ shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002 and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) By December 31, 2002, ~~t~~The owner or operator of any secondary containment system that the owner or operator determines cannot be tested in accordance with this section shall replace the secondary containment system with a system that can be tested in accordance with this section. As an alternative, the owner or operator may submit a proposal and workplan for enhanced leak detection to the local agency in accordance with subdivisions 2644.1 (a)(1), (2), (4), and (5) by July 1, 2002; complete the program of enhanced leak detection by December 31, 2002; and replace the secondary containment system with a system that can be tested in accordance with this section by July 1, 2005. ~~, in accordance with subsections 2644.1(a)(1), (2), (4), and (5), submit a proposed program of enhanced leak~~

~~detection to the local agency by October 1, 2001.~~ The local agency shall review the proposed program of enhanced leak detection within 30 days of submittal or re-submittal. ~~After approval by the local agency, the owner or operator shall implement the program no later than January 1, 2002. Additionally, the owner or operator shall replace this secondary containment with a system that can be tested in accordance with this section on or before July 1, 2005.~~

(2) Secondary containment systems shall ~~must~~ be tested to test criteria no less stringent than those used at installation. Additionally, secondary containment systems shall be tested in accordance with manufacturer's guidelines ~~and~~ or standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. If there are no manufacturers guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer shall be used. ~~In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.~~

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002 the following shall also apply: ~~annual certification of monitoring equipment shall be conducted as follows:~~

(1) ~~Persons~~ A person performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment ~~the annual monitoring equipment certification~~ shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer ~~upon~~ by completion of a manufacturer's refresher course~~. every 36 months.~~ Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Annual ~~The~~ monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

(3) UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

(4) The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency

(5) A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

(2) Any period during which hazardous substances are stored in the tank, and no filling or withdrawal is conducted; and

(3) Any period between cessation of the storage of hazardous substances and the actual completion of closure, pursuant to Article 7, unless otherwise specified by the local agency, pursuant to section 2671(b), during a temporary closure period.

(c) This article shall not apply to underground storage tanks that are designed, constructed, installed, and monitored in accordance with ~~sections 2631 and 2632 or 2633 and 2634 of~~ Article 3.

(d) Owners or operators of tanks monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code shall comply with the requirements of section 2645. Tank systems having a capacity of more than 2,000 gallons shall not be monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code.

(e) An owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well , as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1. Additionally, the following conditions for enhanced leak detection shall apply:

(1) For the purpose of section 2644.1, vent or tank riser piping, vapor recovery piping, and suction piping that meet the definitions of section 2636(a)(1), (2), or (3), are not considered single-walled components.

(2) Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 60 90 calendar days of the date ~~of~~ the notification was mailed. ~~The Program Manager shall make a decision on the request within 30 calendar days of receipt of the request.~~

(3) The request for reconsideration must include the name and address of the subject facility, the name and address of the owner or operator submitting the request, and the reason(s) why the requester believes the board notification was in error. If the request is based on evidence ~~a belief~~ that the UST system in question is greater than 1,000 feet from a public drinking water well, the request shall include a demonstration that the center of the well head is more than 1,000 ft from the closest component of the UST system ~~a sealed map showing the location of the subject UST system and the location of the nearest public drinking water well.~~ If the request is based on

evidence ~~a determination~~ **that the subject UST system does not have a single-walled**

component, the request shall include supporting documentation. A copy of the request shall be concurrently submitted to the local agency.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25292 and **25292.4,** Health and Safety Code; 40 CFR 280.40, 280.42 and 280.43(b).

2641. Monitoring Program Requirements

(a) Owners or operators of existing underground storage tanks subject to this article shall implement a monitoring program which is capable of detecting an unauthorized release from any portion of the underground storage tank system at the earliest possible opportunity.

(b) Underground piping shall be exempt from monitoring requirements if the local agency determines that the piping has been designed and constructed in accordance with section 2636(a)(3).

(c) All underground piping that operates at less than atmospheric pressure, unless it is exempt from monitoring under subsection (b), shall comply with the monitoring requirements of section 2643(d) and shall also include daily monitoring as described in Appendix II.

(d) All portions of the underground storage tank system shall be visually monitored in accordance with section 2642. A portion of the underground storage tank shall be exempt from visual monitoring if the owner demonstrates to the satisfaction of the local agency that one or more of the following conditions apply to that portion:

(1) It is not accessible for direct viewing;

(2) Visual inspection would be hazardous or would require the use of extraordinary personal protection equipment other than normal protective equipment such as steel-toed shoes, hard hat, or ear protection; or

(3) The underground storage tank is located at a facility which is not staffed on a daily basis.

(e) Non-visual monitoring shall be implemented for all portions of the underground storage tank which are exempt under subsection (d) and, for the underground storage tank, during periods when visual monitoring required under subsection (d) is not conducted. This non-visual monitoring shall include a quantitative release detection method as specified in section 2643 or a qualitative release detection method as specified in section 2644 or a combination of these methods as approved by the local agency.

(f) Non-visual monitoring for underground pressurized piping shall include a quantitative release detection method that complies with the performance requirements in section 2643(c)(1).

(g) The monitoring program shall be approved by the local agency and shall be in compliance with the requirements of this article and with the underground storage tank operating permit. The local agency may require additional monitoring methods specified in the operating permit or more frequent monitoring as necessary to satisfy the objective in subsection (a). In deciding whether to approve a proposed monitoring program, or to require additional methods or more frequent monitoring, the local agency shall consider the following factors:

(1) The volume and physical and chemical characteristics of the hazardous substance(s) stored in the underground storage tank;

(2) The compatibility of the stored hazardous substance(s) and any chemical-reaction product(s) with the function of monitoring equipment or devices;

(3) The reliability and consistency of the proposed monitoring equipment and systems under site-specific conditions;

(4) The depth and quantity of ground water and the direction of ground water flow;

(5) The patterns of precipitation in the region and any ground water recharge which occurs as a result of precipitation;

(6) The existing quality of ground water in the area, including other sources of contamination and their cumulative impacts;

(7) The current and potential future uses (e.g., domestic, municipal, agricultural, industrial supply) of ground water in the area;

(8) The proximity and withdrawal rates of ground water users in the area;

(9) The type, homogeneity, and range of moisture content of the backfill material and native soils and their probable effects on contaminant migration and detection;

(10) The presence of contamination in the excavation zone or surrounding soils;

(11) The proximity of the underground storage tank to surface waters; and

(12) Additional hydrogeologic characteristics of the zone surrounding the underground storage tank.

(h) The monitoring program shall include written monitoring procedures and a response plan as set forth in section 2632(d).

(i) If the local agency does not approve the monitoring program, the owner or operator shall replace, repair, upgrade, or close the tank in accordance with the applicable provisions of this chapter and local agency approval.

(j) Equipment and devices used to monitor underground storage tanks shall be installed, calibrated, operated, and maintained in accordance with **section 2637(b).** ~~**manufacturer's instructions, including routine maintenance and service checks (at least once per calendar year) for operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.**~~

(k) When an unauthorized release is indicated during the installation of a release detection system, the owner or operator shall comply with the release reporting requirements of Article 5 and, if the release came from the existing tank, shall cease the installation process until the tank system is replaced, repaired, upgraded, or closed in accordance with the applicable provisions of this chapter.

(l) When implementation of the monitoring program, or any condition, indicates that an unauthorized release may have occurred, the owner or operator shall comply with the release reporting requirements of Article 5 and shall replace, repair, or close the underground storage tank in accordance with the applicable provisions of this chapter.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25283, **25284.1**, 25291 and 25292 Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, to add new section 2644.1 of the California Code of Regulations as follows:

2644.1 Enhanced Leak Detection

(a) An owner or operator who is required, pursuant to section 2640(e), to implement a program of enhanced leak detection or monitoring shall comply with the requirements of this section as follows:

(1) Enhanced leak detection means a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system.

(2) The enhanced leak detection test method shall be third party certified, in accordance with section 2643(f), for the capability of detecting both vapor and liquid phase releases from the underground storage tank system. The enhanced leak detection test method shall be capable of detecting a leak rate of at least ~~0.05~~ 0.005 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the local agency within 6 months following notification by the board The enhanced leak detection shall be implemented no later than *12 18 months following* receipt of notification from the board and repeated every 36 months thereafter.

(3) Owners and operators of underground storage tanks subject to the requirements of this section must notify the local agency at least 48 hours prior to conducting the enhanced leak detection test unless this notification requirement is waived by the local agency.

(4) Owners and operators of underground storage tanks subject to the requirements of this section shall submit a copy of the enhanced leak detection test report to the board and the local agency within 60 days of completion of the test.

Authority cited: Sections 25299.3, and 25299.7, Health and Safety Code.
Reference: Sections 25283, 25291, 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows:

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping **<u>and dispensers.</u>**

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998**<u>. Upgrade requirements for dispensers shall be completed no later than December 31, 2003</u>**.

(i) As a preventive measure, an owner or operator may upgrade any underground storage tank constructed of any material which is not under pressure and which contains motor vehicle fuel as specified in sections 2662(a), (c), and (e). Before upgrading in accordance with this subsection, the owner or operator shall prove to the satisfaction of the local agency that the underground storage tank system has not caused an unauthorized release. If soil samples are taken, the owner or operator shall notify the local agency in advance of taking the samples.

(j) Owners or operators shall maintain records of repairs, linings, and upgrades that demonstrate compliance with the requirements of this article for the remaining operating life of the tank.

(k) Local agencies shall not approve a repair or upgrade unless it can be demonstrated that the underground storage tank system is structurally sound and the method of repair or upgrade will prevent unauthorized releases due to structural failure or corrosion during the operating life of the underground storage tank system.

(l) The materials used in the repair or upgrading process shall be applied in accordance with nationally recognized engineering practices.

(m) Materials used in repairs and upgrades shall be compatible with the existing underground storage tank system materials and shall not be subject to deterioration due to contact with the hazardous substance being stored.

(n) Steel underground storage tanks that exhibit external corrosion during the course of repair or upgrade shall comply with the cathodic protection requirements of section 2635(a)(2).

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections **<u>25284.1</u>**, 25292, 25292.1 and 25296, Health and Safety Code; 40 CFR 280.21, 280.33 and 281.32(d)

2666. Requirements for Upgrading Underground Piping <u>and Dispensers</u>

(a) By December 22, 1998, all underground piping containing hazardous substances other than motor vehicle fuel shall be retrofitted with secondary containment meeting the requirements of section 2636.

(b) By December 22, 1998, all underground piping containing motor vehicle fuel and connected to an existing tank shall be retrofitted with secondary containment unless the owner or operator demonstrates to the local agency that the piping is constructed of fiberglass reinforced plastic, cathodically protected steel, or other materials compatible with stored products and resistant to corrosion. The secondary containment system shall meet the construction, installation, and monitoring requirements of section 2636.

(c) By December 22, 1998, all automatic line leak detectors for underground pressurized piping which is not secondarily contained shall be capable of shutting off the pump when a release occurs. In addition, the pumping system shall shut down automatically if the automatic line leak detector fails or is disconnected. In lieu of the above, for underground storage tank emergency generator systems, the leak detector must be connected to an audible and visible alarm to indicate a release or malfunction of the system.

(d) All underground piping and secondary containment shall be tested for tightness after installation in accordance with section 2636(e).

<u>**(e) By December 31, 2003, all existing underground storage tanks shall be retrofitted with under-dispenser containment, or a dispenser spill containment or control system. The under-dispenser containment or dispenser spill containment or control system shall meet, where applicable, the requirements of *2636(h)(2), or 2636(h)(3).***</u>

Authority cited : Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section <u>**25284.1**</u>, 25292 and 25292.1, Health and Safety Code; 40 CFR 280.21.

7.

MONITORING SYSTEM CERTIFICATION

For Use By All Jurisdictions Within the State of California
Authority Cited:- Chapter 6.7, Health and Safety Code; Chapter 16, Division 3, Title 23, California Code of Regulations

This form must be used to document testing and servicing of monitoring equipment. ~~If more than one monitoring system control panel is installed at the facility, a~~ A separate certification or report must be prepared for each monitoring system control panel by the technician who performs the work. A copy of this form must be provided to the tank system owner/operator. The owner/operator must submit a copy of this form to the local agency regulating UST systems within 30 days of test date. ~~Instructions are printed on the back of this page.~~

A. General Information

Facility Name: ______________________ Bldg. No.: __________

Site Address: ______________________ City: __________ Zip: __________

Facility Contact Person: ______________________ Contact Phone No.: (____) __________

Make/Model of Monitoring System: ______________________ Date of Testing/Servicing: ___/___/___

B. Inventory of Equipment Tested/Certified

Check the appropriate boxes to indicate specific equipment inspected/serviced~~.~~:

Tank ID: ______	Tank ID: ______
☐ In-Tank Gauging Probe. Model: ______	☐ In-Tank Gauging Probe. Model: ______
☐ Annular Space or Vault Sensor. Model: ______	☐ Annular Space or Vault Sensor. Model: ______
☐ Piping Sump / Trench Sensor(s). Model: ______	☐ Piping Sump / Trench Sensor(s). Model: ______
☐ Fill Sump Sensor(s). Model: ______	☐ Fill Sump Sensor(s). Model: ______
☐ Mechanical Line Leak Detector. Model: ______	☐ Mechanical Line Leak Detector. Model: ______
☐ Electronic Line Leak Detector. Model: ______	☐ Electronic Line Leak Detector. Model: ______
☐ Tank Overfill / High-Level Sensor. Model: ______	☐ Tank Overfill / High-Level Sensor. Model: ______
☐ Dispenser Containment Sensor(s). Model: ______	☐ Dispenser Containment Sensor(s). Model: ______
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).
Tank ID: ______	Tank ID: ______
☐ In-Tank Gauging Probe. Model: ______	☐ In-Tank Gauging Probe. Model: ______
☐ Annular Space or Vault Sensor. Model: ______	☐ Annular Space or Vault Sensor. Model: ______
☐ Piping Sump / Trench Sensor(s). Model: ______	☐ Piping Sump / Trench Sensor(s). Model: ______
☐ Fill Sump Sensor(s). Model: ______	☐ Fill Sump Sensor(s). Model: ______
☐ Mechanical Line Leak Detector. Model: ______	☐ Mechanical Line Leak Detector. Model: ______
☐ Electronic Line Leak Detector. Model: ______	☐ Electronic Line Leak Detector. Model: ______
☐ Tank Overfill / High-Level Sensor. Model: ______	☐ Tank Overfill / High-Level Sensor. Model: ______
☐ Dispenser Containment Sensor(s). Model: ______	☐ Dispenser Containment Sensor(s). Model: ______
☐ Shear Valve(s).	☐ Shear Valve(s).
☐ Dispenser Containment Float(s) and Chain(s).	☐ Dispenser Containment Float(s) and Chain(s).
☐ Other (specify equipment type and model in Section E on Page 2).	☐ Other (specify equipment type and model in Section E on Page 2).

C. Certification

- I certify that the equipment identified in this document was inspected/serviced in accordance with the manufacturers' guidelines. Attached to this Certification is information (e.g. manufacturers' checklists) necessary to verify that this information is correct and a ~~Site~~ Plot Plan showing the layout of monitoring equipment. For any equipment capable of generating such reports, I have also attached a copy of the report; *(check all that apply)*:

☐ System set-up
☐ Alarm history report.

Technician Name (print): ______________ ~~Cert./Lic. No.: ________~~ Signature: ______________

Certification No.: ______________ License. No.: ______________

Testing Company Name: ______________ Phone No.: (____) ______________

Monitoring System Certification

Site Address: ____ Date of Testing/Servicing: ___/___/___

D. Results of Testing/Servicing

Software Version Installed: ______________________________

Complete the following checklist:

☐ Yes	☐ No*	Is the audible alarm operational?
☐ Yes	☐ No*	Is the visual alarm operational?
☐ Yes	☐ No*	Were all sensors visually inspected, functionally tested, and confirmed operational?
☐ Yes	☐ No*	Were all sensors installed at lowest point of secondary containment and positioned so that other equipment will not interfere with their proper operation?
☐ Yes	☐ No* ☐ N/A	If alarms are relayed to a remote monitoring station, is all communications equipment (e.g. modem) operational?
☐ Yes	☐ No* ☐ N/A	For pressurized piping systems, does the turbine automatically shut down if the piping secondary containment monitoring system detects a leak, fails to operate, or is electrically disconnected? If yes: -which sensors initiate positive shut-down? *(Check all that apply)* ☐ Sump/Trench Sensors; ☐ Dispenser Containment Sensors. Did you confirm positive shut-down due to leaks <u>and</u> sensor failure/disconnection? ☐ Yes; ☐ No.
☐ Yes	☐ No* ☐ N/A	For tank systems that utilize the monitoring system as the primary tank overfill warning device (i.e. no mechanical overfill prevention valve is installed), is the overfill warning alarm visible and audible at the tank fill point(s) and operating properly? If so, at what percent of tank capacity does the alarm trigger? ________%
☐ Yes*	☐ No	Was any monitoring equipment replaced? If yes, identify specific sensors, probes, or other equipment replaced and list the manufacturer name and model for all replacement parts in Section E, below.
☐ Yes*	☐ No	Was liquid found inside any secondary containment systems designed as dry systems? *(Check all that apply)* ☐ Product; ☐ Water. If yes, describe causes in Section E, below.
☐ Yes	☐ No*	Was monitoring system set-up reviewed to ensure proper settings? Attach set up reports, if applicable
☐ Yes	☐ No*	Is all monitoring equipment operational per manufacturer's specifications?

***In Section E below, describe how and when these deficiencies were or will be corrected.**

E. Comments: ____

____

____

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Site Address: ______________________________ Date of Testing/Servicing: ___/___/___

F. In-Tank Gauging / SIR Equipment:

❑ Check this box if tank gauging is used only for inventory control.
❑ Check this box if no tank gauging or SIR equipment is installed.

This section must be completed if in-tank gauging equipment is used to perform leak detection monitoring.

Complete the following checklist:

❑ Yes	❑ No*	Has all input wiring been inspected for proper entry and termination, including testing for ground faults?
❑ Yes	❑ No*	Were all tank gauging probes visually inspected for damage and residue buildup?
❑ Yes	❑ No*	Was accuracy of system product level readings tested?
❑ Yes	❑ No*	Was accuracy of system water level readings tested?
❑ Yes	❑ No*	Were all probes reinstalled properly?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

G. Line Leak Detectors (LLD):

❑ Check this box if LLDs are not installed.

Complete the following checklist:

❑ Yes	❑ No* ❑ N/A	For equipment start-up or annual equipment certification, was a leak simulated to verify LLD performance? *(Check all that apply)* Simulated leak rate: ❑ 3 g.p.h.; ❑ 0.1 g.p.h ; ❑ 0.2 g.p.h.
❑ Yes	❑ No*	Were all LLDs confirmed operational and accurate within regulatory requirements?
❑ Yes	❑ No*	Was the testing apparatus properly calibrated?
❑ Yes	❑ No* ❑ N/A	For mechanical LLDs, does the LLD restrict product flow if it detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if the LLD detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system is disabled or disconnected?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system malfunctions or fails a test?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, have all accessible wiring connections been visually inspected?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

H. Comments:

UST Monitoring ~~Site~~ Plot Plan

Site Address: ____

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

November 22, 2000

MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

DETAILED STATEMENT OF REASONS

The specific reason for each amended, added, or deleted regulation is summarized below.

Section 2611. Additional Definitions

The term "Spill Containment or Control System" is changed to "Dispenser Spill Containment or Control System" in order to clarify that these systems apply only to dispensers. This revision has no regulatory effect.

Section 2630. General Applicability of Article

Subsection 2630(d) is amended to clarify that secondary containment monitoring devices must be capable of detecting a leak at the earliest possible opportunity. This precludes tank owners or operators from tampering with their probes so as to avoid detecting small leaks or water in the system. These changes have no regulatory affect.

Section 2635. Installation and Testing Requirements for All New Underground Storage Tanks.

The proposed amendments to subsection 2635(d)(1) are changed in order to set the start date for the new tank installer requirements, and to clarify that re-certification must be done at the time interval established by the manufacturer, or at least every 36 months.

Section 2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping

The title section 2636, which was proposed to be amended to include under-dispenser containment, is returned to its original language because the SWRCB determined that the change was not needed. This change has no regulatory effect.

The original text of section subsections 2636(f) and (g) are amended to clarify the appropriate methods for monitoring under-dispenser containment. These changes are being made in response to comments from several commenters who expressed concern that mechanical pump shut-off switches may not be allowed for under-dispenser monitoring.

Under-dispenser containment is secondary containment for the short portion of pressurized piping underneath the dispenser that is single-walled, therefore under-dispenser containment is subject to the same monitoring requirements as the remainder of the piping system for a secondarily contained system. Health and Safety Code (HSC) Section 25291 requires that secondary containment shall be monitored by a continuous leak detection system with an **alarm**, and that pressurized piping shall be equipped with an automatic line leak detector and tightness tested annually (subdivisions 25291(a)(6), and (e)). For single-walled systems that have under-dispenser containment, only the portion of the piping system that is double-walled (i.e. the piping that is secondarily contained by under-dispenser containment) is subject to the monitoring requirements for secondarily contained systems.

Current regulations that implement, clarify, and make specific the requirements of HSC (Section 2636) require that piping monitoring systems activate an audible and visual alarm. This would seem to preclude, as indicated in the above comment, mechanical float switches as an acceptable method for under-dispenser containment monitoring. However, many local agencies have allowed these systems to be used for under-dispenser containment monitoring, with concurrence from the SWRCB, because they provide an effective means of preventing leaks under the dispenser by automatically shutting off fuel to the dispenser when a leak is detected.

The SWRCB believes that a mechanical float switch is just as effective an "**alarm,**" for the purpose of monitoring under-dispenser containment, as an audible and visual alarm that may be tampered with, or ignored, allowing the leak to continue. Therefore the regulations have been revised to clarify that mechanical float switches are acceptable as an alternative to an audible and visual alarm.

Subsection 2636(h)(1)(B) is changed to better reflect the requirements of the law (Health and Safety Code subsection (25284.1(a)(5)(A).

Subsection 2636(h)(2) is changed because there are likely to be systems that have the sensor a long distance from the under-dispenser piping, thereby significantly delaying, or preventing, the detection of a leak from the under-dispenser piping. Additionally, this deleted provision conflicts with amended subsection 2630(d) which requires that monitoring equipment be installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity. For under-dispenser piping, the earliest possible opportunity is at a low point directly beneath the piping.

Sections 2636.1 and 2636.2

Sections 2636.1 and 2636.2 are revised to accommodate the amending of "Spill Containment or Control System" to "Dispenser Spill Containment or Control System." These revisions have no regulatory effect.

Section 2637. Secondary Containment Testing and Annual Maintenance Certification

Proposed subsection 2637(a) is changed because identification of examples of secondary containment is not necessary. This revision has no regulatory effect.

Proposed subsection 2637(a)(1) is changed in response to comments which requested that the SWRCB clarify who makes the determination that a secondary containment system cannot be tested. We left this decision with the owner or operator since it is their contractor that conducts the test and can determine whether or not the system can be tested. Furthermore, we believe there is no advantage to the owner or operator to falsely claim that their secondary containment system(s) cannot be tested, given the alternative of removal by December 31, 2002, or removal by July 1, 2005 plus one event of enhanced leak detection.

Proposed subsection 2637(a)(1) is further amended in response to comments requesting that an option be given for owners or operators of secondary containment systems that cannot be tested to only be required to remove the system, rather than conduct enhanced leak detection and remove the system. The commenter requested that secondary containment systems removed by December 31, 2003 should be exempt from any enhanced leak detection. We chose December 31, 2002 for this deadline because it corresponds with the phase-out deadline for MTBE, and still provides sufficient time to remove most systems. For those choosing to conduct one event of enhanced leak detection in exchange for more time to remove their secondary containment system, the deadline for submitting the proposal for enhanced leak detection has been changed to accommodate the new requirements for non-testable systems.

Proposed subsection 2637(a)(2) is amended to delete the provision that allows the local agency to determine the method of secondary containment testing, in order to maintain consistency for secondary containment testing throughout the state.

Proposed subsection 2637(b)(1)(C) is amended to clarify that re-certification must be done at the time interval established by the manufacturer, or at least every 36 months.

Section 2640. General Applicability of Article

Subsection 2640(e)(2) is changed to decrease the number of days tank owners and operators have to appeal the SWRCB identification of their facility as subject to enhanced leak detection. This change was made because the SWRCB believes that 60 days is sufficient time to appeal, and because it reduces the time in which enhanced leak detection must be conducted in the event the appeal is denied. Additionally, the provision that limits the time the SWRCB has to review the an appeal is deleted because the SWRCB may be inundated by enhanced leak detection notification appeals and thus will need significantly more time to review them.

Subsection 2640(e)(3) is changed to incorporate language that clarifies the points of measure used to determine if a facility is within 1,000 ft of a drinking water wall. This is necessary for cases where the SWRCB enhanced leak detection identification is appealed and the distance between the facility and the public drinking water well is close to 1,000 ft.

Section 2644.1 Enhanced leak Detection

Subsection 2644.1(a)(2) is changed to decrease the maximum leak rate capability for enhanced leak detection methods. The previous maximum leak rate (0.05 gallons per hour) was based on the SWRCB's assessment of the best available, third-party certified, technology at the time the proposed regulations were written. Since that time, the SWRCB has become aware that the best available, third-party certified, technology is capable of detecting leaks at 0.005 gallons per hour.

Single-walled tank systems leak directly into the soil and/or ground water because there is no secondary containment to stop the leak from entering the environment. Because of this, and because the facilities subject to enhanced leak detection are close to public drinking water wells, the SWRCB believes the amount of fuel that may leak undetected into the environment needs to minimized. The reduction in leak rate from 0.05 gph to 0.005 gph reduces this volume from 440 gallons per year to 44 gallons per year. This is a significant reduction volume and hence, a significant reduction in the risk for public drinking water wells from leaking single-walled fuel tanks.

Subsection 2644.1(a)(3) is changed to increase the amount of time that tank owners and operators have to implement enhanced leak detection. This change was made due to concerns by the SWRCB that it may be difficult for tank owners and operators to arrange for enhanced leak detection if there are a very limited number of vendors qualified to conduct it. Additionally, subsection 2644.1(a)(3) is further amended to require that enhanced leak detection be conducted triennially. This was inadvertently omitted from the proposed regulations.

Appendix VI. Monitoring System Certification Form

The changes made to the Monitoring System Certification Form streamline and clarify the form but have no regulatory effect.

B. DECEMBER 22, 2000 TO JANUARY 8, 2001

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

STATEMENT OF MAILING NOTICE
(Pursuant to Section 44 of Title 1 of the California Code of Regulations)

The State Water Resources Control Board (SWRCB) has complied with the provisions of Government Code section 11346.8(c) regarding the public notification of changes to proposed regulations. The notification was mailed on **December 22, 2000.** The public comment period began on **December 22, 2000** and ended **January 8, 2001 (21 days).**

Dated: December 22, 2000
By: Chris. [signature]
Title : Assoc. Engineering Geologist

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

December 22, 2000

NOTICE OF MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

Pursuant to the requirements of Government Code section 11346.8(c), and section 44 of Title 1 of the California Code of Regulations, the State Water Resources Control Board (SWRCB) is providing notice of additional changes made to proposed regulations to implement Senate Bill 989. These regulations were the subject of a regulatory hearing on July 18, 2000. Changes to these proposed regulations in response to comments received prior to, and during, the public hearing, were also the subject of an additional 15-day comment period that began November 22, 2000 and ended December 11, 2000. Further changes to the proposed regulations have been made in response to comments received during the 15-day comment period, and these changes are the subject of this notice.

The text of the proposed amended regulations, and the statement of reasons for the revisions, are attached. **The changes made for this 15-day comment period are indicated by italic typeface either in double strikeout, or double underline.**

The SWRCB will accept written comments regarding the changes made to the proposed SB 989 regulations, and additional amendments to Chapter 16 to accommodate those changes, relating to this 15-day notice. All written comments must be submitted to the SWRCB no later than 5:00 p.m. on January 8, 2001, and addressed to:

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA, 94244-2120
Attn: Charles NeSmith

Comments may also be faxed to Charles NeSmith at: **(916) 341-5808**

All written comments received by January 8, 2001 that pertain to the indicated changes will be reviewed and responded to by the SWRCB staff as part of the compilation of the rulemaking file. Please limit your comments to revisions of the proposed SB 989 regulations, and changes in the original text to accommodate those revisions, identified in this 15-day notice.

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

December 22, 2000

MODIFICATIONS OF PROPOSED TEXT OF REGULATIONS

Amend Title 23, Division 3, Chapter 16, Article 1, section 2611 of the California Code of Regulations to read as follows:

2611. Additional Definitions

Unless the context requires otherwise, the following definitions shall apply to terms used in this chapter.

"Bladder system" means a flexible or rigid material which provides primary containment including an interstitial monitoring system designed to be installed inside an existing underground storage tank.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. The term includes only persons who have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"Coatings expert" means a person who, by reason of thorough training, knowledge, and experience in the coating of metal surfaces, is qualified to engage in the practice of internal tank lining inspections. The term includes only those persons who are independent of any lining manufacturer or applicator and have no financial interest in the tank or tanks being monitored.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which hazardous substances flow. For the purpose of determining how much piping is connected to any individual underground storage tank system, the piping that joins two underground storage tank systems should be allocated equally between them.

"Continuous monitoring" means a system using equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

"Dispenser" means an aboveground or underground device ~~connected to underground storage tank piping~~ that is used for the delivery of a hazardous substance from ~~the~~ an underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.

~~*"Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.*~~

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

"Heating oil tank" means a tank located on a farm or at a personal residence and which holds no more than 1,100 gallons of home heating oil which is used consumptively at the premises where the tank is located.

"Holiday," when used with respect to underground storage tank coating or cladding, means a pinhole or void in a protective coating or cladding.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Inconclusive" means the conclusion of a statistical inventory reconciliation report that is not decisive as to whether a release has been detected.

"Independent testing organization" means an organization which tests products or systems for compliance with voluntary consensus standards. To be acceptable as an independent testing organization, the organization shall not be owned or controlled by any client, industrial organization, or any other person or institution with a financial interest in the product or system being tested. For an organization to certify, list, or label products or systems in compliance with voluntary consensus standards, it shall maintain formal periodic inspections of production of products or systems to ensure that a listed, certified, or labeled product or system continues to meet the appropriate standards.

"Independent third party" means independent testing organizations, consulting firms, test laboratories, not-for-profit research organizations and educational institutions with no financial interest in the matters under consideration. The term includes only those organizations which are not owned or controlled by any client, industrial organization, or any other institution with a financial interest in the matter under consideration.

"Integral secondary containment" means a secondary containment system manufactured as part of the underground storage tank.

"Interstitial space" means the space between the primary and secondary containment systems.

"Leak threshold" means the value against which test measurements are compared and which serves as the basis for declaring the presence of a leak. The leak threshold is set by the manufacturer in order to meet state and federal requirements. Leak threshold is not an allowable leak rate.

"Liquid asphalt tank" means an underground storage tank which contains steam-refined asphalts.

"Liquefied petroleum gas tank" means an underground storage tank which contains normal butane, isobutane, propane, or butylene (including isomers) or mixtures composed predominantly thereof in a liquid or gaseous state having a vapor pressure in excess of 40 pounds per square inch absolute at a temperature of 100 degrees Fahrenheit.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing hazardous substances.

"Manufacturer" means any business which produces any item discussed in these regulations.

"Manual inventory reconciliation" means a procedure for determining whether an underground tank system is leaking based on bookkeeping calculations, using measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically. This term does not include procedures which are based on statistical inventory reconciliation.

"Membrane liner" means any membrane sheet material used in a secondary containment system. A membrane liner shall be compatible with the substance stored.

"Membrane liner fabricator" means any company which converts a membrane liner into a system for secondary containment.

"Membrane manufacturer" means any company which processes the constituent polymers into membrane sheeting from which the membrane liner is fabricated into a system for secondary containment.

"Motor vehicle" means a self-propelled device by which any person or property may be propelled, moved, or drawn.

"Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil.

"New underground storage tank" means an underground storage tank which is not an existing underground storage tank.

"Non-volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and consideration of circumstances and physical phenomena internal or external to the tank.

"Operational life" means the period beginning when installation of the tank system has begun until the time the tank system should be properly closed.

"Operator" means any person in control of, or having responsibility for, the daily operation of an underground storage tank system.

"Person", as defined in Chapter 6.7 of Division 20 of the Health and Safety Code includes any entity defined as a person under the Federal Act.

"Perennial ground water" means ground water that is present throughout the year.

"Petroleum" means petroleum including crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.

"Pipeline leak detector" means a continuous monitoring system for underground piping capable of detecting at any pressure, a leak rate equivalent to a specified leak rate and pressure, with a probability of detection of 95 percent or greater and a probability of false alarm of 5 percent or less.

"Probability of detection" means the likelihood, expressed as a percentage, that a test method will correctly identify a leaking underground storage tank.

"Probability of false alarm" means the likelihood, expressed as a percentage, that a test method will incorrectly identify a "tight" tank as a leaking underground storage tank.

"Qualitative release detection method" means a method which detects the presence of a hazardous substance or suitable tracer outside the underground storage tank being tested.

"Quantitative release detection method" means a method which determines the integrity of an underground storage tank by measuring a release rate or by determining if a release exceeds a specific rate.

"Release detection method or system" means a method or system used to determine whether a release of a hazardous substance has occurred from an underground tank system into the environment or into the interstitial space between an underground tank system and its secondary containment.

"Repair" means to restore a tank or underground storage tank system component that has caused a release of a hazardous substance from the underground storage tank system.

"Septic tank" means a tank designed and used to receive and process biological waste and sewage.

~~**"Spill containment or control system" means a device that is capable of preventing an unauthorized release from the dispenser from entering the soil or groundwater or both.**~~

"Statistical inventory reconciliation" means a procedure to determine whether a tank is leaking based on the statistical analysis of measured throughput and a series of daily inventory records taken manually by the tank owner or operator or recorded electronically.

"Statistical inventory reconciliation provider" means the developer of a statistical inventory reconciliation method that meets federal and state standards as evidenced by a third-party evaluation conducted according to section 2643(f), or an entity that has been trained and certified by the developer of the method to be used. In either case, the provider shall have no direct or indirect financial interest in the underground storage tank being monitored.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment

is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Substantially beneath the surface of the ground" means that at least 10 percent of the underground tank system volume, including the volume of any connected piping, is below the ground surface or enclosed below earthen materials.

"Sump," "pit," "pond," or "lagoon" means a depression in the ground which lacks independent structural integrity and depends on surrounding earthen material for structural support of fluid containment.

"Tank integrity test" means a test method that can ascertain the physical integrity of an underground storage tank. The term includes only test methods which are able to detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of 5 percent or less. The test method may be either volumetric or non-volumetric in nature. A leak rate is reported using a volumetric test method, whereas, a non-volumetric test method reports whether a substance or physical phenomenon is detected which may indicate the presence of a leak.

"Unauthorized release" as defined in Chapter 6.7 of Division 20 of the Health and Safety Code does not include intentional withdrawals of hazardous substances for the purpose of legitimate sale, use, or disposal.

"Under-Dispenser Containment" means secondary containment that is located under a dispenser.

"Under-Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release from under the dispenser from entering the soil or groundwater or both.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, secondary containment, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of hazardous substances.

"Upgrade compliance certificate" includes a numbered decal, file copy of the decal, and plastic fill pipe tag as described in Section 2712.1 of these regulations.

"Volumetric test" means a tank integrity test method that ascertains the physical integrity of an underground storage tank through review and comparison of tank volume.

"Voluntary consensus standards" means standards that shall be developed after all persons with a direct and material interest have had a right to express a viewpoint and, if dissatisfied, to appeal at any point (a partial list of the organizations that adopt voluntary consensus standards are shown in Appendix I, Table B).

"Wastewater treatment tank" means a tank designed to treat influent wastewater through physical, chemical, or biological methods and which is located inside a public or private wastewater treatment facility. The term includes untreated wastewater holding tanks, oil water separators, clarifiers, sludge

holding tanks, filtration tanks, and clarified water tanks that do not continuously contain hazardous substances.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25282, 25283, 25284, **25284.1**, 25292.3 and 25299.5(a), Health and Safety Code; 40 CFR 280.10 and 280.12.

Amend Title 23, Division 3, Chapter 16, Article 3, existing sections 2630, 2631, 2635, and 2636 of the California Code of Regulations to read as follows:

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping ~~and Under-dispenser Containment.~~

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems shall be sloped so that all releases will flow to a collection sump located at the low point of the underground piping.

(2) Primary piping and secondary containment systems shall be installed in accordance with an industry code of practice developed in accordance with voluntary consensus standards. The owner or operator shall certify that the piping was installed in accordance with the above requirements of section 2635(d). The certification shall be made on the "Certification of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(d) Lined trench systems used as part of a secondary containment system shall be designed and constructed according to a code of practice or engineering standard approved by a state registered professional engineer. The following requirements shall also apply:

(1) All trench materials shall be compatible with the substance stored and evaluated by an independent testing organization for their compatibility or adequacy of the trench design, construction, and application.

(2) The trench shall be covered and capable of supporting any expected vehicular traffic.

(e) All new primary piping and secondary containment systems shall be tested for tightness after installation in accordance with manufacturer's guidelines. Primary pressurized piping shall be tested for tightness hydrostatically at 150 percent of design operating pressure or pneumatically at 110 percent of design operating pressure. If the calculated test pressure for pressurized piping is less than 40 psi, 40 psi shall be used as the test pressure. The pressure shall be maintained for a minimum of 30 minutes and all joints shall be soap tested. A failed test, as evidenced by the presence of bubbles, shall require appropriate repairs and retesting. If there are no manufacturer's guidelines, secondary containment systems shall be tested using an applicable method specified in an industry code or engineering standard. Suction piping and gravity flow piping which cannot be isolated from the tank shall be tested after installation in conjunction with an overfilled volumetric tank integrity test, or other test method meeting the requirements of section 2643(f), if approved by the local agency.

(f) Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems as follows:

(1) All ~~The~~ secondary containment, including under-dispenser containment, *and under-dispenser spill control or containment systems* ~~-system~~ shall be equipped with a continuous monitoring system that either activates ~~which meets the requirements of section 2643(f) and which is connected to~~ an audible and visual alarm ~~system~~ or stops the flow of product at the dispenser when it detects a leak.

(2) Automatic line leak detectors shall be installed on underground pressurized piping and shall be capable of detecting a 3-gallon per hour leak rate at 10 psi within 1 hour with a probability of detection of at least 95 percent and a probability of false alarm no greater than 5 percent. ~~Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.~~

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section. ~~A~~ Ccontinuous monitoring systems as described in subdivision (1), which shuts down the pump in addition to either activating the audible and visual alarm system or stopping the flow of product at the dispenser, satisfyies the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure of the product piping system at the test pressure with at least a 95 percent probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) All The secondary containment systems is are equipped with ~~a~~ continuous monitoring systems. The leak detection device may be located at the pump sump for sections of ~~if~~ the piping that slopes back to this point.

(2) All A continuous monitoring systems is for the piping are connected to ~~an audible and visual alarm system and~~ the pumping system.

(3) All ~~A~~ continuous monitoring systems for the piping shuts down the pump and either activates an audible and visual the alarm system or stop the flow of product at the dispenser when they detect a leak ~~a release is detected~~.

(4) The pumping system shuts down automatically if any of the continuous monitoring systems for the piping fail or are is disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:

(1) Owners or Operators of a UST system shall have the system fitted with under-dispenser containment, or an approved *under*-dispenser spill containment or control system according to the following schedule:

(A) At the time of installation for systems installed after January 1, 2000.

(B) By July 1, 2001, for systems installed after July 1, 1987 that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state ~~notified by the board according to its~~ Geographic Information System mapping database.

(C) By December 31, 2003, for systems not subject to subsection 2636(h)(1)(A) or (B).

(2) Under-dispenser containment ~~must~~ shall be designed, constructed, installed, and monitored in accordance with section 2631, 2636(c)(2), 2636(e), and 2636(f). ~~**Separate monitoring for under-dispenser containment is not required if the lowest point of the under-dispenser containment drains to a monitoring point within the connected piping system.**~~

(3) A manufacturer of a*n* *under*-dispenser spill containment or control system may apply to the Division of Clean Water Programs Underground Storage Tank Program Manager for approval of the system. Owners or operators shall not install a*n* *under*-dispenser spill containment or control system that has not been approved.

(A) Applications for approval shall be submitted in writing and include the following:

(i) A description of the proposed system.

(ii) Clear and convincing evidence that the system will protect the soil and beneficial uses of the waters of the state from unauthorized releases.

(B) The Program Manager shall review the application to determine if the proposed system adequately protects the soil and beneficial uses of

groundwater before determining whether to approve the proposed system.

(C) The Program Manager may modify or revoke a previously issued approval if it finds that, based on new evidence, the approved system does not adequately protect the soil and beneficial uses of groundwater from unauthorized releases.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25299, Health and Safety Code; 40 CFR 280.20, 280.40-280.45.

Amend Title 23, Division 3, Chapter 16, Article 3, to add new sections 2636.1, 2636.2, 2636.3, 2636.4 and 2637 of the California Code of Regulations as follows:

2636.1. Final Division Decisions Regarding *Under*-Dispenser Spill Containment or Control Systems

(a) A manufacturer of a*n under*-dispenser spill containment or control system who disagrees with a determination by the Program Manager not to approve the manufacturer's system under section 2636(h)(3)(B) or to modify or revoke a previously issued approval of the manufacturer's system under section 2636(h)(3)(C) may ask for a review by the Division Chief.

(b) An appeal to the Division Chief must be in writing and must be accompanied by all material that the manufacturer wishes to be considered by the Division Chief, and by the Board in any subsequent review by the Board. The appeal must contain an explanation why the manufacturer believes the Program Manager's determination is erroneous, inappropriate, or improper.

(c) The Division Chief shall render a Final Division Decision within 30 days of receipt of the appeal. A Final Division Decision is final and conclusive unless the manufacturer files a petition for review with the Board that is received by the Board within 30 days from the date of the Final Division Decision.

(d) The Division Chief may at any time, on the Division Chief's own motion, issue a Final Division Decision.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.2. Petition for Board Review Regarding *Under*-Dispenser Spill Containment or Control Systems

(a) A manufacturer may petition the Board for review of a Final Division Decision.

(b) A petition for Board review shall contain the following:

(1) The name and address of the petitioner;

(2) A statement of the date on which the petitioner received the Division's final decision;

(3) A copy of the Final Division Decision that the Board is requested to review;

(4) An explanation why the petitioner believes the Final Division Decision is erroneous, inappropriate, or improper;

(5) A statement describing how the petitioner is damaged by the Final Division Decision; and

(6) A description of the remedy or outcome desired.

(c) The petition shall be sent to the Board Chairperson, with copies sent to the Chief Counsel of the Board, and the Division Chief.

(d) The petitioner may request a hearing for the purpose of presenting factual material not presented to the Division Chief or for oral argument or both. The request to present material that was not presented to the Division Chief must include a description of the factual material that the petitioner wishes to submit, the facts that the petitioner expects to establish, and an explanation of the reasons why the petitioner could not previously submit the new material to the Division Chief. The petitioner must include with the petition a copy of any new documentary material that the petitioner wishes to present to the Board.

(e) The Division Chief may file a response to the petition with the Board within 30 days of the Board's notification to the petitioner that the petition is complete. The Division must provide a copy of any response to the petitioner. The Board may extend the time for filing a response by the Division Chief.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.3. Defective Petitions

Upon the Board's receipt of a petition which does not comply with section 2636.2 of this chapter, the Board, through its Chief Counsel, will advise the petitioner of the manner in which the petition is defective and allow a reasonable time within which an amended petition may be filed. If the Board does not receive a properly amended petition within the time allowed, the petition shall be dismissed.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2636.4. Action by the Board Regarding *Under*-dispenser Spill Containment or Control Systems

(a) In response to the petition, the Board may:

(1) Refuse to review the petition if it is late or fails to raise substantial issues that are appropriate for Board review;

(2) Affirm the final decision that the Board has been requested to review;

(3) Set aside or modify the final decision that the Board has been requested to review; or

(4) Take such other action as the Board deems appropriate.

(b) Before taking action, the Board may, at its discretion, hold a hearing, or provide for an informal meeting between the petitioner, the Division Chief, a member of the Board, and such other persons as the Board deems appropriate for the purpose of attempting to resolve the dispute.

(c) If an evidentiary hearing is held, it shall be conducted in accordance with the California Code of Regulations, title 23, division 3, Chapter 1.5, article 2.

(d) The Board reserves the right, at its discretion, to consider a petition upon its own motion.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section 25284.1, Health and Safety Code.

2637. Secondary Containment Testing and Annual Maintenance Certification

(a) Secondary containment systems installed o~~O~~n or after January 1, 2001 ~~all secondary containment of underground storage tank systems, including, but not limited to, open secondary containment, lined trench systems, under-dispenser containment, and sumps,~~ shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002 and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) By December 31, 2002, t~~T~~he owner or operator of any secondary containment system that the owner or operator determines cannot be tested

in accordance with this section shall replace the secondary containment system with a system that can be tested in accordance with this section. As an alternative, the owner or operator may submit a proposal and workplan for enhanced leak detection to the local agency in accordance with subdivisions 2644.1 (a)(1), (2), (4), and (5) by July 1, 2002; complete the program of enhanced leak detection by December 31, 2002; and replace the *secondary containment system with a system that can be tested in accordance* with this section by July 1, 2005. ~~, in accordance with subsections 2644.1(a)(1), (2), (4), and (5), submit a proposed program of enhanced leak detection to the local agency by October 1, 2001.~~ The local agency shall review the proposed program of enhanced leak detection within ~~*30*~~ *45* days of submittal or re-submittal. ~~After approval by the local agency, the owner or operator shall implement the program no later than January 1, 2002. Additionally, the owner or operator shall replace this secondary containment with a system that can be tested in accordance with this section on or before July 1, 2005.~~

(2) Secondary containment systems shall ~~must~~ be tested to test criteria no less stringent than those used at installation. Additionally, secondary containment systems shall be tested in accordance with manufacturer's guidelines ~~and~~ or standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. If there are no manufacturers guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer shall be used. ~~In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.~~

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002 the following shall also apply: ~~annual certification of monitoring equipment shall be conducted as follows:~~

(1) Persons ~~A person~~ performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment ~~the annual monitoring equipment certification~~ shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer ~~upon~~ by completion of a manufacturer's refresher course. ~~every 36 months.~~ Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Individuals employed by persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment for the purpose of conducting this work shall meet the requirements of 2637(b)(1)(B) and (C).

~~(2)~~ *(3)* ~~Annual~~ The monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

~~(3)~~ *(4)* UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

~~(4)~~ *(5)* The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency

~~(5)~~ *(6)* A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.

__**Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.**__
__**Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.**__

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

(2) Any period during which hazardous substances are stored in the tank, and no filling or withdrawal is conducted; and

(3) Any period between cessation of the storage of hazardous substances and the actual completion of closure, pursuant to Article 7, unless otherwise specified by the local agency, pursuant to section 2671(b), during a temporary closure period.

(c) This article shall not apply to underground storage tanks that are designed, constructed, installed and monitored in accordance with ~~**sections 2631 and 2632 or 2633 and 2634 of**~~ Article 3.

(d) Owners or operators of tanks monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code shall comply with the requirements of section 2645. Tank systems having a capacity of more than 2,000 gallons shall not be monitored pursuant to section 25292(b)(5)(A) of the Health and Safety Code.

(e) __**An owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well , as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1. Additionally, the following conditions for enhanced leak detection shall apply:**__

(1) __**For the purpose of section 2644.1, vent or tank riser piping, vapor recovery piping, and suction piping that meet the definitions of section 2636(a)(1), (2), or (3), are not considered single-walled components.**__

__**(2) Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager.**__

The request shall be in writing and received by the Underground Storage Tank Program Manager within ~~60~~ 90 calendar days of the date ~~of~~ the notification ~~was mailed. The Program Manager shall make a decision on the request within 30 calendar days of receipt of the request~~ ***The Program Manager shall make a decision on the request, and notify the applicable local agency of this decision, within 90 calendar days of receipt of the request.***

(3) The request for reconsideration must include the name and address of the subject facility, the name and address of the owner or operator submitting the request, and the reason(s) why the requester believes the board notification was in error. If the request is based on evidence ~~a belief~~ that the UST system in question is greater than 1,000 feet from a public drinking water well, the request shall include a demonstration that the center of the well head is more than 1,000 ft from the closest component of the UST system ~~a scaled map showing the location of the subject UST system and the location of the nearest public drinking water well.~~ If the request is based on evidence ~~a determination~~ that the subject UST system does not have a single-walled component, the request shall include supporting documentation. A copy of the request shall be concurrently submitted to the local agency.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25292 and **25292.4,** Health and Safety Code; 40 CFR 280.40, 280.42 and 280.43(b).

Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows:

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping ~~***and dispensers***~~.

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998. ~~***Upgrade requirements for dispensers shall be completed no later than December 31, 2003***~~. ***Requirements for under-dispenser containment, or under-dispenser spill control or containment systems, shall be completed no later than December 31, 2003.***

(i) As a preventive measure, an owner or operator may upgrade any underground storage tank constructed of any material which is not under pressure and which contains motor vehicle fuel as specified in sections 2662(a), (c), and (e). Before upgrading in accordance with this subsection, the owner or operator shall prove to the satisfaction of the local agency that the underground storage tank system has not caused an unauthorized release. If soil samples are taken, the owner or operator shall notify the local agency in advance of taking the samples.

(j) Owners or operators shall maintain records of repairs, linings, and upgrades that demonstrate compliance with the requirements of this article for the remaining operating life of the tank.

(k) Local agencies shall not approve a repair or upgrade unless it can be demonstrated that the underground storage tank system is structurally sound and the method of repair or upgrade will prevent unauthorized releases due to structural failure or corrosion during the operating life of the underground storage tank system.

(l) The materials used in the repair or upgrading process shall be applied in accordance with nationally recognized engineering practices.

(m) Materials used in repairs and upgrades shall be compatible with the existing underground storage tank system materials and shall not be subject to deterioration due to contact with the hazardous substance being stored.

(n) Steel underground storage tanks that exhibit external corrosion during the course of repair or upgrade shall comply with the cathodic protection requirements of section 2635(a)(2).

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections **25284.1**, 25292, 25292.1 and 25296, Health and Safety Code; 40 CFR 280.21, 280.33 and 281.32(d)

2666. Requirements for Upgrading Underground Piping ~~*and Dispensers*~~

(a) By December 22, 1998, all underground piping containing hazardous substances other than motor vehicle fuel shall be retrofitted with secondary containment meeting the requirements of section 2636.

(b) By December 22, 1998, all underground piping containing motor vehicle fuel and connected to an existing tank shall be retrofitted with secondary containment unless the owner or operator demonstrates to the local agency that the piping is constructed of fiberglass reinforced plastic, cathodically protected steel, or other materials compatible with stored products and resistant to corrosion. The secondary containment system shall meet the construction, installation, and monitoring requirements of section 2636.

(c) By December 22, 1998, all automatic line leak detectors for underground pressurized piping which is not secondarily contained shall be capable of shutting off the pump when a release occurs. In addition, the pumping system shall shut down automatically if the automatic line leak detector fails or is disconnected. In lieu of the above, for underground storage tank emergency generator systems, the leak detector must be connected to an audible and visible alarm to indicate a release or malfunction of the system.

(d) All underground piping and secondary containment shall be tested for tightness after installation in accordance with section 2636(e).

(e) By December 31, 2003, all existing underground storage tanks shall be retrofitted with under-dispenser containment, or a*n under*-dispenser spill containment or control system. The under-dispenser containment or *under*-dispenser spill containment or control system shall meet, where applicable, the requirements of 2636(h)(2), or 2636(h)(3).

Authority cited : Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Section **25284.1**, 25292 and 25292.1, Health and Safety Code; 40 CFR 280.21.

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

December 22, 2000

MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

DETAILED STATEMENT OF REASONS

The specific reason for each amended, added, or deleted regulation is summarized below.

Section 2611. Additional Definitions

The definition of "Dispenser" is revised because dispensers are inherently part of the *underground piping system, as defined in Health and Safety Code 25281.5.*

The term "Dispenser Spill Containment or Control System" is changed to "Under-Dispenser Spill Containment or Control System" in order to clarify that these systems apply only to containing or controlling leaks from piping located underneath dispensers.

Section 2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping

Subsection 2636(f)(1) is amended to specifically include under-dispenser spill control or containment systems in order to clarify that these systems must be monitored in accordance with the monitoring requirements for piping.

Subsection 2636(h)(3) is revised to accommodate the amending of "Dispenser Spill Containment or Control System" to "Under-dispenser Spill Containment or Control System." These revisions have no regulatory effect.

Sections 2636.1, 2636.2, and 2636.4

Sections 2636.1, 2636.2, and 2636.4 are revised to accommodate the amending of "Dispenser Spill Containment or Control System" to "Under-dispenser Spill Containment or Control System." These revisions have no regulatory effect.

Section 2637. Secondary Containment Testing and Annual Maintenance Certification

Subsection 2637(a)(1) is amended to allow local agencies additional time to review enhanced leak detection proposals.

Subsection 2637(b) is amended to clarify that individuals employed by a licensed contractor for the purpose of performing annual monitoring maintenance certification, and related work, must be trained and re-certified in accordance with 2637(b)(1)(B) and (C). The reasons for this change are as follows.

In accordance with the California State Contractors Licensing Board statutes, the term "Persons" includes either a contractor that provides the work, or an individual that actually performs the work. As such, under current language, individuals employed by a contractor holding one of the required licenses for the purpose of conducting annual monitoring maintenance certification, and related work, do not need to possess a personal contractor's license.

The SWRCB believes that, under current language, this might also be interpreted by some people to mean that individuals actually performing the work, that are employed by an appropriately licensed contractor, do not need to be trained and re-certified if the contractor is trained and re-certified. This was not the SWRCB's intent in developing this language, nor does it conform with the SWRCB's interpretation of the supporting statute (25284.1(5)(D)(i)).

Section 2640. General Applicability of Article

Subsection 2640(e)(2) is revised to re-instate a time limit for the SWRCB to review enhanced leak detection notification appeals, with the time limit extended to 90 days from 30 days. This provision was reinstated in response to comments from local agencies requesting a time limit so that enhanced leak detection is not delayed indefinitely during the appeals process.

Section 2660. General Applicability of Article

Subsections 2660(g) and 2660(h) are changed because the proposed requirements relate to under-dispenser piping and not to dispensers.

Section 2666. Requirements for Upgrading Underground Piping

Subsection 2666(e) is revised to accommodate the amending of "Dispenser Spill Containment or Control System" to "Under-dispenser Spill Containment or Control System." These revisions have no regulatory effect.

C. JANUARY 9 TO JANUARY 26, 2001

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

STATEMENT OF MAILING NOTICE
(Pursuant to Section 44 of Title 1 of the California Code of Regulations)

The State Water Resources Control Board (SWRCB) has complied with the provisions of Government Code section 11346.8(c) regarding the public notification of changes to proposed regulations. The notification was mailed on **January 9, 2001.** The public comment period began on **January 9, 2001** and ended **January 26, 2001 (18 days).**

Dated: January 9 2001

By: Chas A. Smith

Title: Assoc. Engineering Geologist

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

January 9, 2001

NOTICE OF MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

Pursuant to the requirements of Government Code section 11346.8(c), and section 44 of Title 1 of the California Code of Regulations, the State Water Resources Control Board (SWRCB) is providing notice of additional changes made to proposed regulations to implement Senate Bill 989. These regulations were the subject of a regulatory hearing on July 18, 2000. Changes to these proposed regulations in response to comments received prior to, and during, the public hearing, were also the subject of an additional 15-day comment period that began November 22, 2000 and ended December 11, 2000. As a result of changes made to the proposed text in response to this 15-day comment period, a second 15-day comment period was provided that began December 22 and ended January 8. Another substantial change has been made to the proposed regulations in subdivision 2637(a) (deadline for initial secondary containment test) and is the subject of this third 15-day notice for comments.

The text of the proposed amended regulation, and the statement of reasons for the revision, are attached. **The change made for this 15-day comment period is indicated by shaded bold italic typeface.**

The SWRCB will accept written comments regarding this change that are submitted to the SWRCB no later than 5:00 p.m. on January 26, 2001, and addressed to:

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA, 94244-2120
Attn: Charles NeSmith

Comments may also be faxed to Charles NeSmith at: **(916) 341-5808**

All written comments received by January 26, 2001 that pertain to the indicated change will be reviewed and responded to by the SWRCB staff as part of the compilation of the rulemaking file. Please limit your comments to the revision of the proposed SB 989 regulations identified in this 15-day notice.

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

January 9, 2001

MODIFICATIONS OF PROPOSED TEXT OF REGULATIONS

2637. Secondary Containment Testing and Annual Maintenance Certification

(a) Secondary containment systems installed o~~O~~n or after January 1, 2001 ~~all secondary containment of underground storage tank systems, including, but not limited to, open secondary containment, lined trench systems, under-dispenser containment, and sumps,~~ shall be tested upon installation, 6 months after installation, and every 36 months thereafter. Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002~~3~~ and every 36 months thereafter. Secondary containment testing shall be conducted as follows:

(1) By December 31, 2002, t~~T~~he owner or operator of any secondary containment system that ~~the owner or operator determines~~ cannot be tested in accordance with this section shall replace the secondary containment system with a system that can be tested in accordance with this section. As an alternative, the owner or operator may submit a proposal and workplan for enhanced leak detection to the local agency in accordance with subdivisions 2644.1 (a)(1), (2), (4), and (5) by July 1, 2002; complete the program of enhanced leak detection by December 31, 2002; and replace the secondary containment system with a system that can be tested in accordance with this section by July 1, 2005. ~~, in accordance with subsections 2644.1(a)(1), (2), (4), and (5), submit a proposed program of enhanced leak detection to the local agency by October 1, 2001.~~ The local agency shall review the proposed program of enhanced leak detection within ~~30~~ *45* days of submittal or re-submittal. ~~After approval by the local agency, the owner or operator shall implement the program no later than January 1, 2002. Additionally, the owner or operator shall replace this secondary containment with a system that can be tested in accordance with this section on or before July 1, 2005.~~

(2) Secondary containment systems shall ~~must~~ be tested to test criteria no less stringent than those used at installation. Additionally, secondary containment systems shall be tested in accordance with manufacturer's guidelines ~~and~~ or standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. If there are no manufacturers guidelines, industry codes, or engineering

standards a test method approved by a state registered professional engineer shall be used. ~~In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.~~

(3) Secondary containment testing shall be performed by either a licensed tank tester, licensed tank installer, or any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, unless this notification requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records shall be maintained as required in section 2712. On or after January 1, 2002 the following shall also apply: ~~annual certification of monitoring equipment shall be conducted as follows:~~

(1) ~~Persons~~ A person performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment ~~the annual monitoring equipment certification~~ shall meet the following requirements:

(A) Possess a current Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board.

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer ~~upon~~ by completion of a manufacturer's refresher course. ~~every 36 months.~~ Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Individuals employed by persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment for the purpose of conducting this work shall meet the requirements of 2637(b)(1)(B) and (C).

~~(2)~~ *(3)* ~~Annual~~ The monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

~~(3)~~ *(4)* UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

~~(4)~~ *(5)* The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency

~~(5)~~ *(6)* A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

January 9, 2001

MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

DETAILED STATEMENT OF REASONS

The specific reason for each amended, added, or deleted regulation is summarized below. -

Section 2637. Secondary Containment Testing and Annual Maintenance Certification

Proposed subsection 2637(a) is changed to allow owners and operators of secondarily contained underground storage tank systems installed prior to January 1, 2001 additional time (until January 1, 2003) to conduct the initial secondary containment test. This extension is given because:

1. The proposed regulations are not likely to become law until after April 1, 2001;

2. The SWRCB has received several comments regarding the difficulty and complexity of recurrent testing of existing secondary containment systems; and,

3. The additional time will allow the SWRCB, local agencies, and industry to carefully work through the various issues related to the initial secondary containment test, thus resulting in viable testing procedures that better reflect the intent of the requirement.

IX. UPDATED INFORMATIVE DIGEST

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

UPDATED INFORMATIVE DIGEST

Management of Underground Storage Tanks in California is regulated under both federal and State law. Applicable federal law is found in the Resource Conservation and Recovery Act (RCRA) Subtitle I, Section 9003. Regulations implementing federal laws are found in 40 CFR, part 280. Section 9004, RCRA Subtitle I, permits the U.S.EPA (EPA) to authorize states to implement their own UST programs in place of the federal requirements if the state's requirements are "no less stringent" than EPA's, and provide for adequate enforcement. Applicable state law is incorporated into Health and Safety Code (HSC) Chapter 6.7, commencing with section 25280, and related regulations in Title 23, Division 3, Chapter 16, California Code of Regulations (CCR).

The California legislature enacted HSC Chapter 6.7 in 1984 and has since amended Chapter 6.7 in response to either federal mandates relating to underground storage tanks (UST), or new information regarding changing industry practices and/or the performance of UST's meeting then current UST regulatory standards in California. In October 1999, the legislature again amended Chapter 6.7 by enacting Senate Bill 989, which essentially codifies executive order D-5-99. This executive order was the Governor's response to a University of California report on the environmental impacts of Methyl Tertiary Butyl Ether (MTBE) -- an additive put into motor vehicle fuel beginning in the late 1980's, early 90's. The executive order requires the phase-out of MTBE in fuel by December 31, ~~2002.~~

The University report concluded that, "while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water." This finding was in stark contrast to an earlier study by the Lawrence Livermore National Laboratory regarding leaks of "pre-MTBE" motor vehicle fuel. This study concluded that groundwater plumes resulting from leaking underground storage tanks were very limited in extent (less than 250 feet), and rarely impacted public drinking water supplies. In comparing the different studies, the relative mobility and persistence in the environment of MTBE versus the most mobile constituents of "pre-MTBE" fuel (i.e. benzene, toluene, ethylbenzene, and xylenes) was illuminated, thus resulting in the subject legislation.

Since current underground storage tank laws and regulations were promulgated absent this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with more stringent construction and monitoring standards for underground storage tanks. These new construction and monitoring requirements were mostly based on the recommendations of two SWRCB panels, the Advisory Panel on the Leak History of New and Upgraded UST Systems (Leak History Panel) and the California Leak Monitoring group (CALM). The proposed regulations, where necessary, implement, interpret, and make specific, newly enacted legislation regarding UST installers, secondary containment testing, under-dispenser containment, annual maintenance certification, and leak detection for single-walled UST's.

Under existing California regulations, UST installers are required to receive adequate training by the tank and piping manufacturers whose equipment is being installed (23 CCR 2635(d)(1)). This may, or may not, include re-certification depending on the manufacturers training standards. Comparable federal regulations regarding tank installations are found in 40 CFR section 280.20(d) and (e). Federal regulations allow several options for certifying that a tank installation has been done properly including certification of the installer by the manufacturer, or the implementing agency. However, installer certification is not mandatory.

The proposed additional requirements for UST system installers make specific Health and Safety Code (HSC) subsection 25284.1(a)(4)(A), which mandates the SWRCB to adopt regulations requiring underground storage tank installers to meet minimum training standards. The new requirements simply require UST system installers to be re-certified every 36 months by the manufacturer of the equipment being installed.

The new requirement for tank installer re-certification will help to ensure that UST systems are installed properly by mandating that UST installers maintain currency, both in general terms of tank installing, but more specifically, with the type of system being installed.

Under existing California regulations, secondary containment systems are required to be tested upon installation (23 CCR 2635(a)(4)). There are no comparable federal regulations for testing of secondary containment. The proposed secondary containment testing regulations implement HSC subsection 25284.1(a)(4)(B) and require UST owners and operators to conduct secondary containment testing every 36 months. The testing must demonstrate that the secondary containment system performs at least as well as it did at installation.

Secondary containment systems that cannot be periodically tested because of their inherent design, such as open secondary containment "lined-trench" systems, must replace the system by December 31, 2002, or conduct one event of enhanced leak detection and replace the system by July 5, 2005. Conversely, secondary containment systems that automatically continuously test the secondary containment system by virtue of their design are exempted from secondary containment testing requirements.

Periodic testing of secondary containment systems will provide greater assurance that double-walled UST systems are performing as designed and capable of capturing and containing any leaks from the primary containment. A defective secondary containment system can, under certain conditions, be a greater threat to the environment than a single-walled system. This is because a significant leak may occur in a defective secondary containment system, without triggering an audible or visual alarm, and get into the environment while all concerned continue to believe the system remains tight.

Under-dispenser containment has been a requirement in California since July 1, 1987 when all UST piping installed after that date was required to have secondary containment (HSC 25291(a)(7)(E)). This requirement includes piping located under, and connected to, the dispenser. There are no comparable federal regulations regarding under-dispenser containment.

The specific under-dispenser requirements codified in HSC 25284.1(a)(5) clarify previous law, and also mandate under-dispenser containment for UST systems installed prior to July 1, 1987. This includes all single-walled UST systems. The proposed regulations implement these new requirements. Additionally, the SWRCB has included regulatory language clarifying that under-dispenser containment must be continuously monitored in accordance with the piping monitoring requirements set forth in subdivision 2636(f) and (g) -- these monitoring requirements were clarified to include specific reference to under-dispenser piping. Furthermore, the proposed under-dispenser containment regulations also clarify, and implement, the provision in HSC 25284.1(a)(5) that requires the SWRCB to approve alternate under-dispenser containment referred to in Senate Bill 989 as dispenser "spill containment or control systems" capable of containing any accidental release.

The new under-dispenser containment requirements will provide additional protection for soil and groundwater from fuel leaks at the piping connection point at the fuel dispenser, and clarify under-dispenser monitoring requirements. While dispenser leaks are usually small and slow, if allowed to continue for a long period as they often are, soil and groundwater can be significantly impacted. Again, any MTBE that gets into groundwater from these small leaks may migrate relatively quickly, both horizontally and vertically, in the aquifer system.

Under existing California regulations, UST systems must receive annual maintenance and service checks (23 CCR 2630(d)), however, existing regulations do not impose any licensing, training or certification requirements on persons who perform this work. The proposed regulations implement and make specific HSC subsection 25284.1(a)(5)(D) and require persons performing installation, repair, maintenance, calibration, or annual certification of monitoring equipment to possess a contractors license and be trained and certified by the manufacturer of the monitoring equipment being inspected, and re-certified by the manufacturer every 36 months. Individuals that are employed by a licensed contractor that performs these activities need only be trained, certified, and re-certified by the manufacturer.

The proposed regulations will increase the reliability of annual maintenance work for UST monitoring systems by: 1) requiring trained personnel to conduct the work; and 2) requiring that the inspections be carefully documented on a certification form prepared by the SWRCB.

Under existing California regulations, single-walled UST systems are required to be periodically monitored for leaks that may occur in the tank and/or piping (23 CCR Chapter 16, Article 4). Owners and Operators of these systems are given several options for meeting this requirement, including use of an automatic tank gauge, statistical inventory reconciliation, vapor or ground water monitoring wells, etc. Similar federal leak detection requirements are found in 40 CFR 280 subpart D.

The proposed leak detection requirements implement HSC section 25292.4, which requires enhanced (i.e. additional) leak detection for UST systems with a single-walled component located within 1,000 feet of a public drinking water supply. The SWRCB has interpreted and made specific HSC 25292.4 by: 1) clarifying that vent or tank riser piping, vapor recovery, and suction piping, are not included as single-walled components; 2) providing a means for owners and operators to petition the SWRCB's identification of their facility as being within 1,000 feet of a public drinking water supply; and, 3) limiting acceptable enhanced leak detection methods only to those cost-effective techniques that can accurately determine the location of a leak, and determine if the leak came from the tank system, from spills or overfills, or from previous tank operations.

Public drinking water supplies will have greater protection against leaking fuel containing MTBE, from single-walled systems (within 1,000 ft) through the proposed enhanced leak detection requirements. Even the most well maintained and operated single-walled tank systems may leak below minimum leak detection sensitivities, and thus these small leaks go undetected. Any MTBE that gets into groundwater from these small leaks may migrate relatively quickly, both horizontally and vertically, in the aquifer system and thus may reach nearby public drinking water wells.

X FISCAL IMPACT (form 399, including supporting documentation).

STATE OF CALIFORNIA

ECONOMIC AND FISCAL IMPACT STATEMENT

(REGULATIONS AND ORDERS)

399 (Rev 2-98)

See SAM Sections 6600 - 6680 for Instructions and Code Citations

DEPARTMENT NAME	CONTACT PERSON	TELEPHONE NUMBER
State Water Resources Control Board	Chuck NeSmith	916 2274377
DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400		NOTICE FILE NUMBER
Underground Storage Tank Regulation Amendments for Implementation of SB 989		Z

ECONOMIC IMPACT STATEMENT

A. ESTIMATED PRIVATE SECTOR COST IMPACTS *(Include calculations and assumptions in the rulemaking record.)*

1. Check the appropriate box(es) below to indicate whether this regulation:

- [X] a. Impacts businesses and/or employees
- [X] b. Impacts small businesses
- [X] c. Impacts jobs or occupations
- [ ] d. Impacts California competitiveness
- [X] e. Imposes reporting requirements
- [ ] f. Imposes prescriptive instead of performance standards
- [X] g. Impacts individuals
- [ ] h. None of the above *(Explain below. Complete the Fiscal Impact Statement as appropriate.)*

h. *(cont.)*

(If any box in Items 1 a through g is checked, complete this Economic Impact Statement.)

2. Enter the total number of businesses impacted: 6784 Describe the types of businesses *(Include nonprofits)*: Gasoline retailing (NAICA 447) and other business that own USTs or dispense petroleum products for their own use (number of business from Table 8 bb).

Enter the number or percentage of total businesses impacted that are small businesses: 40% (See attached Small Business Calculation tables 1 & 2)

3. Enter the number of businesses that will be created: unable to calculate eliminated: unable to calculate

Explain: No net businesses created or eliminated. Estimate that any businesses lost will be replaced by expansion of current business or new facilities.

4. Indicate the geographic extent of impacts: [X] Statewide [ ] Local or regional *(list areas)*:

5. Enter the number of jobs created: ______ or eliminated: ______ Describe the types of jobs or occupations impacted: Tank installer/ maitenance.

Unable to calculate net jobs created or eliminated as new required costs for training and certification are similar to many existing manufacturer's policies.

The additional renewal certification requirement is expected to be a minor cost of doing business ($500 every three years or an annual average of $167)

6. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here?

[ ] Yes [X] No If yes, explain briefly: Gasoline retailing and privately owned UST systems are spatially located where needed and not subject to competition from out of state facilities.

B. ESTIMATED COSTS *(Include calculations and assumptions in the rulemaking record.)*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? $81 M - 339 M

a. Initial costs for a small business: $ Attached table 8* Annual ongoing costs: $ Attached table 8 Years: 5 Initial & Ongoing T8

b. Initial costs for a typical business: $ Attached table 8 Annual ongoing costs: $ Attached table 8 Years: 5 Initial & Ongoing T8

c. Initial costs for an individual: $ 500 Annual ongoing costs: $ 167 Years: 5 Table 7, c & d

d. Describe other economic costs that may occur: Vast majority of costs result from implementing statuatory requirement for under dispenser containment UDC

Wide range due to $3,000 to $50,000 estimate for UDC installation derrived from stakeholder meetings and Water Board staff estimates. Initial costs incurred over a several year period for UDC installation. Ongoing costs mainly for triannual secondary containment testing of all double-wall compents of UST systems.

* Column titled initial cost per facility. A small business will typically own 1-5 facilities.

ECONOMIC AND FISCAL IMPACT STATEMENT *cont. (STD. 399, Rev. 2-98)*

2. If multiple industries are impacted, enter the share of total costs for each industry: Vast majority of costs will be incurred by businesses owning petroleum dispensing units requiring under dispenser containment (gasoline retailing NAICA 447).

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. *(Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted)*: $ Similar to current requirement

4. Will this regulation directly impact housing costs? [ ] Yes [X] No If yes, enter the annual dollar cost per housing unit: $__________ and the number of units:__________

5. Are there comparable Federal regulations? [ ] Yes [X] No Explain the need for State regulation given the existence or absence of Federal regulations: Mandated by SB 989, HSC statutes 25284.1 and 25292.4.

Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: $None

C. ESTIMATED BENEFITS *(Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.)*

1. Briefly summarize the benefits that may result from this regulation and who will benefit: Beneficial uses of groundwater will have greater protection against leaking underground storage tanks, associated piping and fuel dispensers.

2. Are the benefits the result of: [X] specific statutory requirements, or [ ] goals developed by the agency based on broad statutory authority?

Explain: Proposed regulations needed to implement new HSC sections 25284.1 and 25292.4 enacted through Senate Bill 989

3. What are the total statewide benefits from this regulation over its lifetime? $ unable to calculate

D. ALTERNATIVES TO THE REGULATION *(Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.)*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: Altneratives considered included: 1) frequency of secondary containment testing, 2) type of enhanced leak detection, 3) timing of re-certification for tank installer training, and 4) timing of re-certification for annual maintenance personnel. No alternatives exist that are equally effective and less costly due to statutory mandates.

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation:	Benefit: $	Cost: $ \$ 81M - 339 M	Table 8: Economic Impact Statement
Alternative 1:	Benefit: $	Cost: $	
Alternative 2:	Benefit: $	Cost: $	

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: Vast majority of cost results from implementing statutory requirements for UDC (with no Water Board discretion). The 36 month cycle for secondary containment and enhanced leak detection testing determined as being most cost-effective balance between cost to industry and improved performance of UST systems based on survey of industry stakeholders and SWRCB staff recommendations. Also, 36 month cycle corresponds with cathodic protection testing currently required.

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? [ ] Yes [ ] No

Explain: Rulemaking does not propose specific technologies

ECONOMIC AND FISCAL IMPACT STATEMENT *cont. (STD. 399, Rev. 2-98)*

E. MAJOR REGULATIONS *(Include calculations and assumptions in the rulemaking record.)*
Cal/EPA boards, offices and departments are subject to the following additional requirements per Health and Safety Code section 57005.

1. Will the estimated costs of this regulation to California business enterprises exceed $10 million ? [X] Yes [ ] No *(If No, skip the rest of this section)*

2. Briefly describe each equally as effective alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

   Alternative 1: Due to statutory mandates no alternatives appear equally effective and less costly. See section D above.

   Alternative 2: ____________________

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation:	$ ____________	Cost-effectiveness ratio: ____________
Alternative 1:	$ ____________	Cost-effectiveness ratio: ____________
Alternative 2:	$ ____________	Cost-effectiveness ratio: ____________

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT *(Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years)*

[ ] 1. Additional expenditures of approximately $ ____________ in the current State Fiscal Year which are reimbursable by the State pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code. Funding for this reimbursement:

[ ] a. is provided in (Item ____________ ,Budget Act of ____________) or (Chapter ____________ ,Statutes of ____________

[ ] b. will be requested in the ____________ (FISCAL YEAR) Governor's Budget for appropriation in Budget Act of ____________

[ ] 2. Additional expenditures of approximately $ ____________ in the current State Fiscal Year which are not reimbursable by the State pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code because this regulation:

[ ] a. implements the Federal mandate contained in ____________

[ ] b. implements the court mandate set forth by the ____________

court in the case of ____________ vs. ____________

[ ] c. implements a mandate of the people of this State expressed in their approval of Proposition No. ____________ at the ____________ (DATE) election;

[ ] d. is issued only in response to a specific request from the ____________

____________, which is/are the only local entity(s) affected;

[ ] e. will be fully financed from the ____________ (FEES, REVENUE, ETC.) authorized by Section

____________ of the ____________ Code;

[ ] f. provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each such unit.

[ ] 3. Savings of approximately $ ____________ annually.

[ ] 4. No additional costs or savings because this regulation makes only technical, non-substantive or clarifying changes to current law and regulations.

[ ] 5. No fiscal impact exists because this regulation does not affect any local entity or program.

[X] 6. Other. The Costs are not unique to local government, e.g., affect both the private sector and the public sector (County of Los Angeles vs State of California et al, 43 Cal App 3d 46 (1987) (from Section 6621 from SAM)

B. FISCAL EFFECT ON STATE GOVERNMENT *(Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.)*

[X] 1. Additional expenditures of approximately $ 0.89 - 4.5 Million in the current State Fiscal Year. It is anticipated that State agencies will:

[ ] a. be able to absorb these additional costs within their existing budgets and resources.

[X] b. request an increase in the currently authorized budget level for the 2000-2001 fiscal year.

[ ] 2. Savings of approximately $ ________ in the current State Fiscal Year.

[ ] 3. *No fiscal impact exists because this regulation does not affect any State agency or program.*

[X] 4. Other. Estimated $182,000 per year ongoing state cost for Enhanced Leak Detection and Secondary Containment Testing on a 3 year Cycle. (from Table D: FISCAL IMPACT STATEMENT COSTS, total of onging costs).

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS *(Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.)*

[ ] 1. Additional expenditures of approximately $ ________ in the current State Fiscal Year.

[ ] 2. Savings of approximately $ ________ in the current State Fiscal Year.

[X] 3. No fiscal impact exists because this regulation does not affect any federally funded State agency or program.

[ ] 4. Other.

SIGNATURE		TITLE
Walt Pettit		31 March 00
AGENCY SECRETARY[1] APPROVAL/CONCURRENCE	Winston H Hickox	DATE 4/24/00
DEPARTMENT OF FINANCE[2] APPROVAL/CONCURRENCE	PROGRAM BUDGET MANAGER [illegible]	DATE 4/29/00

1. *The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6600-6680, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.*

2. *Finance approval and signature is required when SAM sections 6600-6670 require completion of the Fiscal Impact Statement in the STD. 399. However, Finance must immediately receive a copy of each STD. 399 submitted to OAL without Finance signature, and Finance may subsequently question the "no fiscal impact" finding of a state agency.*

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

FISCAL IMPACT ESTIMATES

Mandates on Local Agencies and School districts pursuant to Part 7 (commencing with Section 17500) of Division 4 of the Government Code: The SWRCB has determined that the proposed amendments would not impose a mandate on local agencies or school districts nor are there any costs for which reimbursement is required by Part 7 (commencing with Section 17500) of Division 4 of the Government Code.

Cost or Savings to any State Agency: State agencies that own or operate underground storage tanks (UST's) may incur additional costs as a result of the proposed regulations depending on the type of system installed. The most significant additional cost will be for those systems that must install under-dispenser containment in accordance with the proposed regulations. Based on information provided from various state agencies, the SWRCB estimates that: 1) 77 state-owned facilities will need to install under-dispenser containment (from $3,000 to $50,000 per facility); 2) 205 facilities will need to conduct periodic secondary containment testing (up to $512,500 in the first year and $171,000 annually thereafter); and 3) 34 facilities will need to conduct enhanced leak detection ($ 144,000 initially and annual average of $16,500 thereafter). The SWRCB is unaware of any state-owned UST facilities that have lined trench systems.

The total first year estimated cost to the state as a result of the proposed regulations is $887,000 to $ 4.5 million dollars. Average ongoing state cost will be $187,600 annually. The SWRCB expects that state agencies will not be able to absorb these additional costs within their existing budgets and resources.

Estimate of potential cost or savings subject to reimbursement pursuant to Part 7 (commencing with Section 17500) of Division 4 of the Government Code: None.

Other Non-discretionary Costs or Savings to Local Agencies: Local agencies that own or operate UST's may incur additional costs as a result of the proposed regulations depending on the type of system installed. However, the costs imposed by these regulations are incident to laws of a general application, do not apply uniquely to local governments, and do not add or increase the service from the local government to the public and therefore are not subject to reimbursement pursuant to sections listed above. Obviously, this analysis does not apply to the local governments' cost to carry out the enforcement of SB 989; however, local governments can recover those costs through increased fees under Health and Safety Code section 25287, subdivision (a). Local agencies may also be subject to additional paperwork as a result of handling facility reports containing the results of secondary containment testing and enhanced leak detection, and as a result of reviewing enhanced leak detection program workplans. The SWRCB has determined that the extra local agency staff time needed to handle the additional paperwork will be insignificant, and thus the resulting costs will be insignificant.

Approved by DOF, 4-29-00

TABLE D: FISCAL IMPACT STATEMENT COSTS

Approved by DOF 4-29-00

Total State of California cost of Proposed Regulations

Item		CHP	Source	Dept of Correction	Source	Developmental Services	Source	Mental Health	Source
Under-Tank Dispenser	Low	$ 90,000	A - i	$ 60,000	A -g				
	High	$ 1,500,000.	A - j	$ 1,000,000	A- h				
2nd Containment	Initial	$ -		$ 250,000	B - d	$ 100,000	B - g	$ 37,500	B - j
	Ongoing	$ -		$ 83,333	B - e	$ 33,333	B - h	$ 12,500	B - k
Enhanced Leak Detection	Initial	$ 64,070	C - f	$ 64,070	C - j				
	Ongoing	$ 7,450	C - g	$ 7,450	C - k				
Initial Cost -Lower Range		**$ 154,070**		**$ 374,070**		**$ 100,000**		**$ 37,500**	
Initial Cost - upper range		**$ 1,564,070**		**$ 1,314,070**		**$ 100,000**		**$ 37,500**	
Total Ongoing Cost		**$ 7,450**		**$ 90,783**		**$ 33,333**		**$ 12,500**	

Item		Dept. of Forestry	Source	Caltrans	Source	Dept. General Services	Source	Total State Agency Cost	
Under-Tank Dispenser	Low	$ 6,000	A - k	$ 75,000	A- m	$ -		$ 231,000	c
	High	$ 100,000	A - l	$ 1,250,000	A - n	$ -		$ 3,850,000	b
2nd Containment	Initial	$ 25,000	B - s	$ 62,500	B - m	$ 37,500	B - p	$ 512,500	b c
	Ongoing	$ 8,333	B - t	$ 20,833	B - n	$ 12,500	B - q	$ 170,833	a
Enhanced Leak Detection	Initial			$ 16,018	C - n	$ -		$ 144,158	b c
	Ongoing			$ 1,863	C - o	$ -		$ 16,763	a
Initial Cost -Lower Range		**$ 31,000**		**$ 153,518**		**$ 37,500**		**$ 887,658**	c
Initial Cost - upper range		**$ 125,000**		**$ 1,328,518**		**$ 37,500**		**$ 4,506,658**	b
Total Ongoing Cost		**$ 8,333**		**$ 22,696**		**$ 12,500**		**$ 187,596**	a

Table A: FIS Under-Dispenser Containment

ITEM	Value		Remarks
2636(h)(1)(C)) all remaining UST to have under-dispenser containment by Dec 31, 2003.			**25284.1 (a)(5)(C)**
Cost to install under-dispenser containment, spill containment or control system for a facility - Lower Range	a	$ 3,000	Data estimate from SWRCB
Upper range for under-dispenser containment installation per Facility	b	$ 50,000	Data estimate from SWRCB
Estimate of hybrid tank systems installed 1984-1987 without dispenser containment	c	20	**Dept Corrections**
1-Wall tanks without dispenser containment	d	30	**State 1-Wall - CHP**
1-Wall tanks without dispenser containment	e	2	**Dept of Forestry**
1-Wall tanks without dispenser containment	f	25	**Caltrans**
Number of all remaining UST facilities w/out under-dispenser Cont.		77	**= c + d + e + f**
Department of Corrections			
Cost under-dispenser Installation - Lower Range	g	$ 60,000	**= c * a**
Cost under-dispenser Installation - Lower Range	h	$ 1,000,000	**= c * b**
California Highway Patrol			
Cost under-dispenser Installation - Lower Range	i	$ 90,000	**= d * a**
Cost under-dispenser Installation - Upper Range	j	$ 1,500,000	**= d * b**
Department of Forestry			
Cost under-dispenser Installation - Lower Range	k	$ 6,000	**= e * a**
Cost under-dispenser Installation - Upper Range	l	$ 100,000	**= e * b**
Caltrans			
Cost under-dispenser Installation - Lower Range	m	$ 75,000	**= f * a**
Cost under-dispenser Installation - Upper Range	n	$ 1,250,000	**= f * b**
Total Cost			
Under-dispenser Installation - Lower Range	o	$ 231,000 ✓	**= g + i + k + m**
Under-dispenser Installation - Upper Range	p	$ 3,850,000 ✓	**= h + j + l + n**

what activities, tools, + supplies involved in $3K ~ $50K?

Table B: FIS Secondary Containment

who derived in survey?

ITEM			Value	Remarks
2637 (a) Secondary Containment testing				
Estimate Initial Cost to test a facility	a	$	2,500	Range from $1680-$4597 in SWRCB 10/29 Survey
Estimate Annual Cost thereafter, 3 year test cycle	b	$	833	**= b / 3**
what activities, tools, test equip. needed for $2500 test?				why est $2,500?
Department of Corrections	c		100	Dept Correct Hybrid tanks (2-wall tanks)
Subtotal Initial Cost to test all facilities	d	$	250,000	**= c * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	e	$	83,333	**= c * b**
Developmental Services	f	$	40	State UST Data
Subtotal Initial Cost to test all facilities	g	$	100,000	**= f * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	h	$	33,333	**= f * b**
Mental Health	i	$	15	State UST Data
Subtotal Initial Cost to test all facilities	j	$	37,500	**= i * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	k	$	12,500	**= i * b**
Caltrans	l	$	25	State UST Data
Subtotal Initial Cost to test all facilities	m	$	62,500	**= l * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	n	$	20,833	**= l * b**
Dept. General Services	o	$	15	State UST Data
Subtotal Initial Cost to test all facilities	p	$	37,500	**= o * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	q	$	12,500	**= o * b**
Dept of Forestry	r	$	10	State UST Data
Subtotal Initial Cost to test all facilities	s	$	25,000	**= r * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	t	$	8,333	**= r * b**
Total State Agency Costs	u	$	205	State UST Data
Subtotal Initial Cost to test all facilities	v	$	512,500	**= u * a**
Subtotal Annual Ongoing Cost to test facilities every 3 years	w	$	170,833	**= u * b**

Table C: FIS Enhanced Leak Detection

Item		Value	Remarks
2640 - Enhanced Leak Detection			
2640(e) Required for UST with Single-Walled Component w/I 1000 ft public drinking well			
Initial cost for Enhanced Leak Detection per facility	a	$ 4,300	*SWRCB Response to Meeting 10/28*
Test Costs after initial set-up, performed once every 3 years	b	$ 1,500	SWRCB Response to Meeting 10/28
Estimate of percentage of facilities within 1000-feet of drinking well	c	14.9%	Based on a sample from The Lawrence Livermore National laboratory UST database of sites in Fremont Sunnyvale and Humboldt. Brendan Dooher
CHP			
Number of Single-Walled UST facilities	d	100	State UST Data - CHP
Estimate of percentage of facilities within 1000-feet of drinking well	e	14.9	**= d * c**
Initial Cost of Enhanced Leak Detection	f	$ 64,070	**= a * e**
Annualized Cost of Enhanced Leak Detection	g	$ 7,450	**= (b * e)/3**
Dept of Corrections			
Number of UST facilities with 1-wall components	h	100	State UST Data - Department of Corrections
Estimate of percentage of facilities within 1000-feet of drinking well	i	14.9	**= h * c**
Initial Cost of Enhanced Leak Detection	j	$ 64,070	**= a * i**
Annualized Cost of Enhanced Leak Detection	k	$ 7,450	**= (b * i) / 3**
Caltrans			
Number of UST facilities with 1-wall components	l	25	State UST Data - Caltrans 1-wall tanks
Estimate of percentage of facilities within 1000-feet of drinking well	m	3.73	**= h * c**
Initial Cost of Enhanced Leak Detection	n	$ 16,018	**= a * i**
Annualized Cost of Enhanced Leak Detection	o	$ 1,863	**= (b * m) / 3**
Total State Costs			
Number of UST facilities with 1-wall components	p	225	**= d + h + l**
Estimate of percentage of facilities within 1000-feet of drinking well	q	33.53	**= p * c**
Initial Cost of Enhanced Leak Detection	r	$ 144,158	**= f + j + n**
Annualized Cost of Enhanced Leak Detection	s	$ 16,763	**= g + k + o**

State UST Data

State of California UST Data 24-Feb-00

from Mike Golden 322-8994 Dept of General Services Office of State Architect

Agency	Number	Type	Emergency Back Up	Fuel =	Fuel W/O UDC +	Fuel W UDC	Comments - Data from Mike Golden
CHP	100	Single-Wall Fiberglass	0	100	30	70	100 tanks by Mike Golden 3/27/00
Dept Corrections	100	Double-Wall Hybrid	80	20	20	0	Pipe systems not double-wall, only 20% are fuel dispensing. Steve Woycheshin 2/24/00
Developmental Services	40	Double Wall	40	0	0	0	Doug Yee, DS 2/24/00
Mental Health	15	Double Wall	15	0	0	0	Jenny Holihen , 2/24/00
Dept of Forestry	12	10 2-Wall, 2 1-Wall	0	12	2	10	Mike Golden 3/27/00
Caltrans	50	25 2-Wall, 25 1-Wall	0	50	25	25	Carlos Lopez of Caltrans 3/27/00
Dept of General Services	15	Double-Wall	15	0	0	0	Mike Golden 3/27/00
total	332	=	150 +	182 =	77 +	105	

For FIS Analysis Fuel Dispensing Tanks	USTs Requiring UDC installation	USTs Requiring Enhanced Leak Detection	USTs Requiring 2nd Containment Testing	Total Agency USTs	Tank Type
CHP	30 s	15 s	0	100	1-Wall
Dept Corrections	20 h	15 s	100 h	100	Hybrid
Developmental Services	0	0	40 d	40	2-Wall
Mental Health	0	0	15 d	15	2-Wall
Dept of Forestry	2 s	0	10 d	12	2-Wall
Caltrans	25 s	4 s	25 d	50	1/2 2-Wall
Dept Gen. Services	0	0	15 d	15	2-Wall
Total USTs	***77***	***34***	***205***	***332***	

15% .. single-walled w/in 1000 ft of drinking well

Updated information provided by Mike Golden on 2/18/00 and 2/22/00 and again on 3/27/00 These tables reflects new data.

Note: Most state agencies have replaced their USTs with above ground tanks, Around 1000 above ground tanks now in State service.

s = single
h = hybrid
d = double

single-wall or double-wall hybrid tanks w/o under-dispenser containment

single-wall tanks or double-wall hybrid (ie, w/single-wall piping)

double-wall tanks testing of secondary containment

Table 1: Estimate of Private Single-Walled Tanks from State Database

Item		Value	Remarks		Value	Remarks
Single-Wall USTs	a	110	CHP	aa	20%	Estimate % of new AST where original 1-wall tank might have been upgraded and not replaced if in private ownership (80% would have been replaced with 2-wall)
Double-Wall Hybrid USTs	b	100	Dept. of Corrections	bb	100	**= c * d** estimate of Private 1-wall tanks remaining
Double-Wall USTs	c	60	Total Double-Wall			
Above Ground Tanks	d	500	Replacement tanks			
Total State Tanks	e	770	**= a + b + c + d**			
Estimate Single-wall USTs	f	210	**= a + bb**			
% Private 1-wall	g	**27%**	**= f / e**			
Note:	*Most state agencies have replaced their USTs with above ground tanks as their locations are usually either isolated or secured (unlike most private/corp facilities and therefor were allowed to use above ground tanks.*					

Table 2: Estimate of Private Population of 1-Wall, 2-Wall and Hybrid tanks

ITEM		Value	Remarks	
Privately Owned	h	943,000	From EPA 1989 National UST Survey. Assume that the percentage of Private facilities is similar to the percentage of private tanks.	
Owned by State or Local government	i	110,000		
Percentage of Private	j	89.55%	**= h /(h + i)**	
Number of Regulated Facilities	k	18,939	Data from SWRCB Post 1998 UST Compliance Survey April 23, 1999	
Percentage of Private Single-walled Tanks	l	**27.27%**	**g** above	
Number of Private Hybrid Tanks	m	300	Estimate from SWRCB Staff	
Percentage of Private Hybrid tanks	n	2.05%	**= m / (k - s) * j)**	
Percentage of Private Double-walled tanks	o	**70.68%**	**= 100 % - l - n**	
UST facilities Out of Compliance	p	1,935	Data from SWRCB Post 1998 UST Compliance Survey April 23, 1999	
Facilities with 2-Wall tanks/Upgraded Tanks	q	12,963	Data from SWRCB Post 1998 UST Compliance Survey April 23, 1999	
Facilities in Compliance w/o Dispenser Cont.	r	1,483	Includes Hybrids	
Facilities scheduled for Closure	s	2,564	(Not subject to new regulations)	
Total Regulated Active Private Facilities	t	**14,664**	**= (k - s) * j**	
Active Private 1-wall Facilities	u	**3,999**	**= t * l**	
Active Private 2-wall Facilities	v	**10,365**	**= t * o**	
Active Private Hybrid Facilities	w	300	**= m**	Note Hybrids installed 1984 to 1987

Table 3: Calculation for New Facilities

YEAR		CA POPULATION		% CHANGE	Remarks
1999	a	34,072,478			DOF Projections, see reference below
2000	b	34,653,395	h	1.68%	= (b - a) /a
2001	c	35,233,335	i	1.65%	= (c - b) /b
2002	d	35,802,238	j	1.59%	= (d - c) /c
2003	e	36,363,502	k	1.54%	= (e - d) /d
2004	f	36,899,907	l	1.45%	= (f - e) /e
2005	g	37,372,444	m	1.26%	= (g - h) /g

YEAR		NUM FACILITIES		NEW	
1999	n	20,000			Latest SWRCB Estimate
2000	o	20,335			o = n * (1 + h)
2001	p	20,670	u	335	p = o * (1 + i); u = p - o
2002	q	20,998	v	328	q = p * (1 + j); v = q - p
2003	r	21,323	w	324	r = q * (1 + k); w = r - s
2004	s	21,633	x	310	s = r * (1 + l); x = s - r
2005	t	21,906	y	274	t = s * (1 + m); y = t - s
		Total New Facilities 2001-2005	z	**1,297**	= u + v + w + x + y

Reference:
State of CA, Dept. of Finance, *County Pop. Projections*...Projected changes in California totals, dated December 1998

Estimated growth of facilities proportional to growth in CA population

Table 5: Secondary Containment

ITEM	Value			Remarks
2637 (a) Secondary Containment testing Secondary Containment able to be tested				
New after Jan 1 2001	a		1,297	**Table 3: Item s**
6 month test	b	$	2,500	*Range from $1680-$4597 in SWRCB 10/29 Survey*
every 3 years thereafter	c	$	2,500	Range from $1680-$4597 in SWRCB 10/29 Survey
Additional cost due to new 6 month test	d	$	3,243,088	**a * b**
Total cost for test after 3 year	e	$	3,243,088	**a * c**
Installed prior to Jan 1 2001	f		10,365	**Table 2: Item v** 2-wall tanks
Estimate Initial Cost to test facility	g	$	2,500	Range from $1680-$4597 in SWRCB 10/29 Survey
test every 3 years thereafter	h	$	2,500	Range from $1680-$4597 in SWRCB 10/29 Survey
Estimated Annual cost per facility	i	$	833	**1/3 h**
Initial cost for Secondary Containment testing	j	$	29,155,654	= (a + f) * g
Ongoing Cost for Secondary Containment testing	k	$	9,718,551	= (a + f) * i
Total Estimated 5-year Cost for 2nd Containment testing	l	$	58,311,308	(f + a) *(g + h)
2637(a)(1) Not able to test (open secondary systems) Program of enhanced Leak detection reviewed and approved by Jan 1, 2001	m		345	From Mobil and Arco who have lined trench systems. None of the other major fuel distributors own lined trench systems (based on local agency reports)
Implement Program by Jan 2, 2002 Cost of Program design & Implementation	n	$	4,300	Cost of plan and test From C. NeSmith, Response to 10/28 Survey
Cost for Enhanced Leak Detection test	o	$	1,483,500	**m * n**
Total Cost for Secondary Containment Testing & Enh. Leak Detect.	**p**	**$**	**59,794,808**	**l + o**

Special Note

Potential costs occurring after end of 5 year Analysis Period				If no alternative way to test trench systems is developed then complete replacement of system may be required.
Replacement of system if required by Jan 1, 2005				
Cost of new secondary system at a facility	r	$	150,000	Quote from Mobil
Cost to Replace Lined Trench Systems for all facilities	s	$	51,750,000	**m * r (potential additional cost)**

Table 4 - Under-Dispenser Containment

	ITEM		Value	Remarks
2636(h)(1)(B) USTs installed after 1987 w/in 1000 ft of public drinking well will have under-dispenser containment by July 1, 2001	Number of Sites with 2-wall tanks without dispenser containment installed since 1987	a	1183	**Table 2: item (r - w)** SWRCB Post 1998 UST Compliance Survey, total Facilities otherwise in compliance but without required dispenser containment. Total of 1483 sites without dispenser containment but 300 (so called hybrid) of such sights are from 1984 to 1987.
	Percentage of UST sites within 1000 feet of public drinking well	b	15%	Based on a sample from The Lawrence Livermore National laboratory UST database of sites in Fremont Sunnyvale and Humboldt. Brendan Dooher
	Number of USTs since 1987 w/out under-dispenser Containment w/in 1000 ft	c	176	**= a * b**
	Cost to install under-dispenser containment, spill containment or control system for a facility			
	Lower range cost per facility for under-dispenser containment installation	d	$ 3,000	Data estimate from SWRCB
	Upper range cost per facility for under-dispenser containment installation	e	$ 50,000	Data estimate from SWRCB
	Lower Range total cost to install equipment for system	f	$ 528,801	**= c * d**
	Upper Range to install equipment for systems	g	$ 8,813,350	**= c * e**
2636(h)(1)(C)) all remaining UST to have under-dispenser containment by Dec 31 2003.	Number of private/corp 2-Wall facilities without dispenser containment installed since 1987 NOT w/in 1000 ft of a public drinking well	h	1007	**= a -c**
	Estimate of hybrid tank systems installed 1984-1987 without dispenser containment or double-wall piping	i	300	Estimate by SWRCB staff (CN)
	Number of private/corp 1-Wall tanks without dispenser containment	j	3,999	**Table 2: item u** (No single-wall tank system currently has UDC
	Number of all remaining UST facilities w/out under-dispenser Cont.	l	5306	**= h + i + j**
	Cost to add under-dispenser containment, spill containment or control system to remaining UST facilities			
	Low Estimate for remaining UST Facilities	m	$ 15,918,354	**= l * d**
	High Estimate for remaining UST Facilities	n	$ 265,305,894	**= l * e**
	Total Cost under-dispenser Installation - Lower Range	aa	$ 16,447,155	**= f + m**
	Total Cost under-dispenser Installation - Upper Range	bb	$ 274,119,244	**= g + n**

Table 6: Enhanced Leak Detection

Item	Value			Remarks
ARTICLE 4				
2640 - Enhanced Leak Detection				
2640(e) Required for UST with Single-Walled Component w/I 1000 ft public drinking well				
Number of Single-Walled UST facilities	a		3,999	**Table 2: Item u**
Number of Hybrid facilities (2-Wall tank, 1-wall pipes & components)	b		300	Tanks installed 1984-1987, number SWRCB Staff
Estimate of percentage of facilities within 1000-feet of drinking well	c		15%	Based on a sample from The Lawrence Livermore National laboratory UST database of sites in Fremont Sunnyvale and Humboldt. Brendan Dooher
Facilities subject to regulation	d		641	= **(a + b) * c**
2644.1 (a) Program and Implementation of enhanced Leak Detection				
Program prepared and reviewed by agency w/I 6 months (by 11/00)				
Initial cost for Enhanced Leak Detection per facility	e	$	4,300	SWRCB Response to Meeting 10/28
Test Costs after initial set-up, performed once every 3 years	f	$	1,500	SWRCB Response to Meeting 10/28
Total 5 Year cost per facility	g	$	5,800	**= e + f**
Total Cost of Enhanced Leak Detection	h	$	**3,715,528**	**= d * g**

Table 7: Tank Installer Training

ITEM		Value	Remarks
2633(d)(1): Tank Installer Training			**25284.1(a)(4)(A)** The number of tank installers affected by regulations is estimated to be between 1500 to 3000. This number was obtained as follows: the number of hazardous waste certificates issued (3000) divided by 1/2. This is a very conservative estimate (i.e. estimates more installers than is likely), since many of those with the hazardous materials certificate do not install tanks, but do site investigations.
Number of Tank Installers	**a**	$ 1,500.00	These data were obtained from Mike Brown of CSLB.
Individual Cost of initial certification	**b**	$ 500	Cost of Certification, estimate from Chuck NeSmith, SWRCB Staff
Individual Cost of Renewal (every 3 Years)	**c**	$ 500	Cost of re-certification, estimate from Chuck NeSmith, SWRCB Staff
Individual Ongoing Annual Costs	**d**	$ 167	Estimated annual cost of renewal **c/3**
Total Cost of Initial Certification	**e**	$ 750,000	**= a * b**
Total Cost of Renewal every 3 year	**f**	$ 750,000	**= a * c**
Total Estimated Cost over first 5 Years	**g**	$ 1,500,000	**= e+ f**

2637 (b) Annual Maintenance Certification	0	***Note charges are already in place and being paid by individual installers, there would be NO change in the business practices. In fact, Veeder Root already has a more frequent requirement for re-certification than these in the proposed regs.***

TABLE 8 ECONOMIC IMPACT STATEMENT SUMMARY DATA

	ITEM	VALUE		REMARKS
Number of Businesses	**Number of Active Facilities**	aa	14,664	Table 2, Item t,
	Number of Business	bb	6,784	**= Business calculation sheet, Table 3**

Initial Costs for Businesses (EIS B: 1a & b, Initial costs, assume typical business is a small business)	Item		Initial Cost per facility		Source	Number of Facilities		Source	Total Intitial cost for businesses		Remarks
	Under-Tank Dispenser	Initial Low	a	$ 3,000	Table 4, Item d	h	176	Table 4, item c	n	$ 528,000	= a * h By 7/1/01
		Initial High	b	$ 50,000	Table 4, Item e	i	176	Table 4, item c	o	$ 8,800,000	= b * i By 7/1/01
		Remaining Low	c	$ 3,000	Table 4, Item d	j	5306	Table 4, item l	p	$ 15,918,354	= c * j By 12/31/03
		Remaining High	d	$ 50,000	Table 4, Item e	k	5306	Table 4, item l	q	$ 265,305,894	= d * k By 12/31/03
	2nd Containment	Existing	e	$ 2,500	Table 5, Item g	l	10,365	Table 5, Item f	r	$ 25,912,566	= e * l
	Enhanced Leak Detection for Trench	systems	f	$ 4,300	Table 5, Item n	m	345	Table 5, Item m	s	$ 1,483,500	= f * m
	Enhanced Leak Detection		g	$ 4,300	Table 6 Item e	n	641	Table 6 Item d	t	$ 2,754,616	= g * n
	Total Initial Lower Cost for Businesses								u	$ 46,597,035	= n+p+r+s+t
	Total Initial Upper cost for Businesses								v	$ 304,256,575	= o+q+r+s+t

Annual Ongoing Costs For Businesses (EIS B: 1 a & b onging costs)	Item	Annual cost per facility		Source	Number of Facilities		Source	Total Annual cost for businesses		Remarks
	2nd Containment	A	$ 833	Table 5, Item i	C	10,365	Table 5, Item f	E	$ 8,637,522	= A * C
	Enhanced Leak Detection	B	$ 500	Table 6, Item f/3	D	641	Table 6, Item d	F	$ 320,304	= B * D
	Total Annualized Cost For Businesses							G	$ 8,957,826	= E + F

Total cost of Proposed Regulations (EIS B:1)					
	Under-Tank Dispenser	Low	H	$ 16,447,155	Table 4, Item aa
		High	I	$ 274,119,244	Table 4, Item bb
	2nd Containment	subtotal	J	$ 59,794,808	Table 5, Item r
	Enhanced Leak Detection	subtotal	K	$ 3,715,528	Table 6, Item h
	Total Cost Tank Installer Training		L	$ 1,500,000	Table 7, Item g
	Total Cost -Lower Range -		M	$ 81,457,491	= H + J + K + L
	Total Cost - Upper range		N	$ 339,129,580	= I + J + K + L

Note

Table 4 = Under-Dispenser Containment Sheet
Table 5 = Secondary Containment Sheet
Table 6 = Enhanced Leak Detection Sheet

Business Calculation Table 1 Information drawn from sample from UST cleanup fund claims database				
		Private	Public	Total
Number of records in sample		—	—	294
Number of tax identification numbers	Total	192	17	209
	Priority B	80	2	82
	Other	112	15	127

Business Calculation Table 2 Estimate of number of small businesses owning tanks			
Item	Interpretation	Number	Source
Number of records in database	Number of sites	13,617	*Count from database provided by DCWP staff*
Number of unique tax identification numbers	Number of business and government agencis owning tanks	6,894	Count from database provided by DCWP staff
Estimated number of nongovernment tax identification numbers	Number of businesses number of businesses owning tanks	6,300	*~= 6,894 x (192/209)*
Percentage of nongovernment tax numbers that are unique private businesses	Estimated percentage of unique businesses from number of facilities in database	46%	~ = 6300/13617
Percentage of nongovernment tax numbers that are priority B	Percentage of affected businesses that are small businesses	40%	~= 80/192

Data from Leaking Underground Storage Tank Cleanup Fund Data Base, SWRCB

Business Calculation Table 3 Estimate number of businesses affected by regulations			
Item	Interpretation	Number	Source
* ~~Number of facilities in sample~~		14664	Table 2, Item t
Percentage of nongovernment tax numbers that are unique private businesses (from above)	Estimated percentage of unique businesses from number of facilities in database (from above)	46%	~ = 6300/13617
Number of unique private businesses	Number of private businesses affected by proposed regulations	6,784	= 14664 * 46%

* Number of regulated private facilities

XI FINAL STATEMENT OF REASONS

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

FINAL STATEMENT OF REASONS

PROBLEM, REQUIREMENT, OR OTHER CONDITION ADDRESSED

These proposed regulations amend sections 2611, 2630, 2631, 2635, 2636, 2640, 2641, 2660, and 2666; and add new sections 2636.1, 2636.2, 2636.3, 2636.4, 2637 and 2644.1 in Title 23 of the California Code of Regulations (CCR). These regulatory changes are needed in order to *implement* Health and Safety Code (HSC) sections 25284.1 and 25292.4, and in part, to update the underground storage tank (UST) regulations to reflect the passage of previously established regulatory deadlines.

These amendments to Title 23 will:

1. Require UST owners or operators to conduct triennial testing of UST secondary containment systems, including testing of under-dispenser containment;

2. Require UST owners or operators of UST systems, which have a single-walled component and are located within 1,000 feet of a public drinking water well, to conduct triennial enhanced leak detection. This enhanced leak detection must be a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

3. Require all UST owners and operators, including those who own or operate single-walled UST systems, to install under-dispenser containment by December 31, 2003. Some UST systems must have the under-dispenser containment installed prior to that date.

4. Require persons who conduct UST monitoring equipment annual maintenance certification to have a California contractors license, and be certified, and triennially re-certified, by the manufacturer of the monitoring equipment being tested;

5. Require UST installers to be triennially re-certified by the manufacturer of the tank system being installed

<u>General Statement of Reasons</u>

The California legislature enacted Health and Safety Code (HSC) Chapter 6.7, commencing with section 25280, in 1984 and has since amended Chapter 6.7 in response to either federal mandates relating to underground storage tanks, or new information regarding changing industry practices and/or the performance of UST's meeting then current UST regulatory standards in California. In October 1999, the legislature again amended Chapter 6.7 by enacting Senate Bill 989, which essentially codifies executive order D-5-99. This executive order was the Governor's response to a University of California report on the environmental impacts of MTBE (an additive put into motor vehicle fuel beginning in the late 1980's, early 90's), and requires the phase-out of MTBE in fuel by December 31, 2002.

The University report concluded that, "while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water." This finding was in stark contrast to earlier studies regarding leaks of "pre-MTBE" motor vehicle fuel which concluded that the resulting groundwater plumes were very limited in extent (less than 250 feet), and rarely impacted public drinking water supplies. In comparing the different studies, the relative mobility and persistence in the environment of MTBE versus the most mobile constituents of "pre-MTBE" fuel (i.e. benzene, toluene, ethylbenzene, and xylenes) was illuminated, thus resulting in the subject legislation.

Since current underground storage tank laws and regulations were promulgated absent this new information on MTBE, additional provisions were included in Senate Bill 989 to supplement the phase-out of MTBE with more stringent construction and monitoring standards for underground storage tanks. These new construction and monitoring requirements were mostly based on the recommendations of two SWRCB panels, the Advisory Panel on the Leak History of New and Upgraded UST Systems (Leak History Panel) and the California Leak Monitoring group (CALM). The proposed regulations, where necessary, implement, interpret, and make specific, the newly enacted legislation.

MANDATE ON PUBLIC SCHOOLS / LOCAL AGENCIES

The SWRCB has determined that the proposed amendments would not impose a mandate on local agencies or school districts nor are there any costs for which reimbursement is required by Part 7 (commencing with Section 17500) of Division 4 of the Government Code.

EFFORT TO AVOID DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS

Based on careful review of the federal underground storage tank statutes and regulations, the SWRCB has determined that none of the proposed regulations conflict with, or duplicate, federal rules. The SWRCB proposes to adopt these regulations, which are different from federal regulations, because these differing state regulations are authorized by Health and Safety Code sections 25284.1 and 25292.4.

ALTERNATIVES CONSIDERED

The SWRCB has considered alternatives to these regulations within the scope allowed by HSC sections 25284.1 and 25292.4. These alternatives are discussed in the Detailed Statement of Reasons below, and in the SWRCB responses to comments. The SWRCB has determined that no alternative to these regulations would be more effective or as effective and less burdensome to the affected industry, local governments, and state agencies than the proposed regulations.

DETAILED STATEMENT OF REASONS

The specific reason for each amended, added, or deleted regulation is summarized below.

Section 2611. Additional Definitions

This section defines the terminology used in Chapter 16. The three new definitions, "dispenser", "under-dispenser containment", and "under-dispenser spill containment or control system" are needed to implement new Health and Safety Code (HSC) subsection 25284.1, which specifically requires under-dispenser containment for all UST systems by December 31, 2003. Previously, under-dispenser containment was indirectly required by HSC 25291(a)(7)(E), which mandates secondary containment for piping for UST systems installed after July 1, 1987. This requirement for secondary containment includes the piping connected to the dispenser.

Section 2630. General Applicability of Article

Subsection 2630(a) is amended to reflect the current state of the law.

Subsection 2630(b) is amended in accordance with HSC section 25291(a)(7), which only allows alternative design and construction requirements for underground storage tank systems installed prior to January 1, 1997.

Subsection 2630(d) is amended to accommodate the new requirements for annual maintenance certification of UST monitoring systems as set forth in subsection 2637(b). Additionally, Subsection 2630(d) is amended to clarify that secondary containment monitoring devices must be capable of detecting a leak at the earliest possible opportunity. This precludes tank owners or operators from tampering with their probes so as to avoid detecting small leaks or water in the system. These changes have no regulatory affect.

Section 2631. Design and Construction Requirements for New Underground Storage Tanks

Subsection 2631(a) is amended in order to ensure that secondary containment systems are designed and installed to be periodically tested in accordance with the secondary containment testing requirements of new section 2637.

Section 2635. Installation and Testing Requirements for All New Underground Storage Tanks.

Subsection 2635(d)(1) is amended in response to HSC 25284.1(a)(4)(A), which mandates the SWRCB to adopt regulations requiring underground storage tank installers to meet minimum training standards. The minimum standards set forth by the SWRCB herein are largely based on the SWRCB advisory panel report "Leak History of New and Upgraded UST Systems" which indicates that installation errors account for many of the leaks found in new and upgraded systems. Therefore, periodic installer re-certification is needed to ensure adequate competency in installing UST's properly. Additionally, UST installers need to continuously update their skills with respect to changing technology and installation methods.

Section 2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping

Subsections 2636(f) and (g) are amended to clarify the appropriate methods for monitoring under-dispenser containment. Under-dispenser containment is secondary containment for the short portion of pressurized piping underneath the dispenser that is single-walled, therefore under-dispenser containment is subject to the same monitoring requirements as the remainder of the piping system for a secondarily contained system. Health and Safety Code (HSC) Section 25291 requires that secondary containment shall be monitored by a continuous leak detection system with an alarm, and that pressurized piping shall be equipped with an automatic line leak detector and tightness tested annually (subdivisions 25291(a)(6), and (e)). For single-walled systems that have under-dispenser containment, only the portion of the piping system that is double-walled (i.e. the piping that is secondarily contained by under-dispenser containment) is *subject to the monitoring requirements for secondarily contained systems.*

Current regulations that implement, clarify, and make specific the requirements of HSC (Section 2636) require that piping monitoring systems activate an audible and visual alarm. This would seem to preclude, as indicated in the above comment, mechanical float switches as an acceptable method for under-dispenser containment monitoring. However, many local agencies have allowed these systems to be used for under-dispenser containment monitoring, with concurrence from the SWRCB, because they provide an effective means of preventing leaks under the dispenser by automatically shutting off fuel to the dispenser when a leak is detected.

The SWRCB believes that a mechanical float switch is just as effective an "**alarm,**" for the purpose of monitoring under-dispenser containment, as an audible and visual alarm that may be tampered with, or ignored, allowing the leak to continue. Therefore the regulations have been revised to clarify that mechanical float switches are acceptable as an alternative to an audible and visual alarm.

Subsection 2636(h)(1)(B) is changed to better reflect the requirements of the law (Health and Safety Code subsection (25284.1(a)(5)(A).

Subsection 2636(h)(2) is changed because there are likely to be systems that have the sensor a long distance from the under-dispenser piping, thereby significantly delaying, or preventing, the detection of a leak from the under-dispenser piping. Additionally, this deleted provision conflicts with amended subsection 2630(d) which requires that monitoring equipment be installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity. For under-dispenser piping, the earliest possible opportunity is at a low point directly beneath the piping.

Subsection 2636(h)(1) is added to codify HSC subsection 25284.1(a)(5). Subsection 2636(h)(2) adds the requirement that under-dispenser containment must be designed, constructed, installed and monitoring in accordance with the pertinent provisions of Chapter 16.

Finally, subsection 2636(h)(3) clarifies and implements the provision in HSC 25284.1(a)(5) that requires the SWRCB to approve dispenser "spill containment or control systems" capable of containing any accidental release.

Section 2636.1 Action by the Division Regarding Spill Containment or Control Systems; Section 2636.2 Petition for Board Review Regarding Spill Containment or Control Systems; Section 2636.3 Defective Petitions; Section 2636.4 Action by the Board Regarding Spill Containment or Control Systems

Sections 2636.1 through 2636.4 are added to outline the specific process by which a manufacturer may petition the Division and the Board for review of a determination by the Program Manager regarding the initial approval, or modification or revocation of prior approval of a spill containment or control system.

Section 2637. Secondary Containment Testing and Annual Maintenance Certification

Subsection 2637(a) is added because testing of secondary containment systems at the time of installation, and periodically thereafter, is required by HSC 25284.1(a)(4)(B). The initial post-installation test is set at 6 months after installation in order to ascertain the effects on the secondary containment system of factors such as: 1) settlement of the backfill; 2) installation errors (not found during initial testing); and 3) connections that have become separated as an indirect result of (1) and (2).

A 36-month cycle for testing the secondary containment system was chosen as a cost-effective compromise to the annual time-interval recommended by the majority of respondents to a secondary containment testing survey conducted by the SWRCB. The SWRCB believes that the slightly increased benefits to be gained from annual secondary containment testing (versus triennial) do not warrant the added cost to industry.

Subsection 2637(a)(1) is added in recognition of the difficulty, if not impossibility, of periodically testing some existing secondary systems after the first test at installation. However, because open secondary containment systems were initially installed in accordance with Article 3, they must meet the requirements of secondarily contained tank systems. Therefore the enhanced leak detection requirement is only used as an interim measure in lieu of the secondary containment testing requirements, until the secondary containment system can comply with Article 3 by either: 1) being replaced with a system that can be tested periodically; or 2) being tested by a method for adequately testing these systems that is developed within the 5 year interim period. The SWRCB did not want to extend the interim period beyond 5 years for the following reasons: 1) out of fairness to owners and operators of secondary containment systems that are currently able to comply with the secondary containment testing requirements; and, 2) to carry out the intent of the law that all systems installed after July 1, 1987 include effective secondary containment.

Subsection 2637(a)(1) does not prohibit replacement of the secondary containment system with another open secondary containment system. However, the new system must be designed to be periodically tested in accordance these secondary containment testing requirements.

Subsections 2637(a)(2) and (3) are consistent with current SWRCB regulations regarding the testing and installation of UST equipment. These requirements ensure that secondary containment testing is conducted properly such that the results of the testing are reliable. This reliability is obtained by testing the secondary containment in accordance with the specifications of the equipment manufacturer or, if there are no manufacturer specifications for secondary containment testing, in accordance with generally accepted industry practices. In some cases neither of these standards are available or applicable, and thus a state registered professional engineer needs to specify the testing criteria.

Subsections 2637(a)(4) and (5) are needed in order to keep local agencies updated on the status of the site, and are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Subsection 2637(a)(6) is needed in order to provide an exemption for secondary containment monitoring systems that automatically and continuously test the secondary containment system by virtue of their design. Brine filled and pressure/vacuum systems rely on changes in the status of the monitoring medium in order to indicate potential leaks from the primary tank system. However, by the nature of this design, the monitoring system also works just as well for detecting leaks in the secondary containment since there may be loss of brine, or pressure loss/gain, through a breach in the secondary containment.

Subsection 2637(b) is a rewrite of former section 2630(d). Section 2637(b)(1)(A) implements the licensing requirements established for annual monitoring equipment certification pursuant to HSC section 25284.1(a)(5)(D).

Subsections 2637(b)(1)(B) and (C) are needed to ensure that annual maintenance technicians are adequately trained, and remain current with respect to the equipment installed at the facility being tested. Thirty-six months was chosen for periodic refresher training because this interval was shown to be an adequate balance, based on the best professional judgment of SWRCB staff, between the cost (in money and time) of recurrent training versus the need for the training. In making this decision, the SWRCB considered the following factors: 1) the rapidly evolving technology of leak detection equipment; 2) the large variety of leak detection equipment currently being used by industry; and 3) the frequency by which the work is conducted.

Subsection 2637(b)(2) is included to clarify that individuals employed by a contractor holding one of the required licenses for the purpose of conducting annual monitoring maintenance certification, and related work, do not need to possess a personal contractor's license. This is because, in accordance with the California State Contractors Licensing Board statutes, the term "Persons" includes either a contractor that provides the work, or an individual that actually performs the work.

Subsection 2637(b)(3) is needed because a specific reporting form: 1) provides consistency for annual maintenance inspections; and 2) can be used as a checklist to ensure that all necessary work is completed.

Subsections 2637(b)(4) and (5) are needed in order to keep local agencies updated on the status of the site and are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Subsection 2637(b)(6) includes the requirement to affix a tag/sticker on each monitoring equipment component involved in the annual maintenance certification because these tags/stickers will indicate to local agency staff that at least the equipment was touched during the inspection. This requirement was recommended by the California Leak Monitoring Group report.

Section 2640. General Applicability of Article.

Amendments to subsection 2640(c) are editorial and have no regulatory effect.

Subsection 2640(e) is added in order to implement the enhanced leak detection requirements of HSC 25292.4(a). The exemptions specified in 2640(e)(1) are the same as those allowed for new double-walled systems. The reconsideration clause in 2640(e)(2) and (3) allows tank owners or operators to contest SWRCB notification in cases where they believe this notification was done in error thereby obtaining relief from the enhanced leak detection requirements.

Section 2641. Monitoring Program Requirements

Subsection 2641(j) is amended to accommodate the new requirements for annual maintenance certification of UST monitoring systems set forth in subsection 2637(b).

Section 2644.1 Enhanced leak Detection

Section 2644.1 is added to specify the requirements for enhanced leak detection in accordance with HSC 25292.4(a). Subsections 2644.1(a)(1) and (2) represent the SWRCB's chosen methodology and performance requirements for implementation of the enhanced leak detection provisions of HSC 25292.4(c). In preparing these requirements, the SWRCB complied with the provisions in HSC 25292.4(c) that the SWRCB shall: 1) consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures to implement the enhanced leak detection or monitoring program; and 2) consider existing leak detection technology (internal methods) and external monitoring techniques or procedures for underground tanks. The above was accomplished by holding a staff level public meeting on October 28, 1999; and through full consideration of related written comments submitted to the SWRCB which proposed both internal and external methods and technology for enhanced leak detection.

In evaluating options for enhanced monitoring, the SWRCB weighed several factors including method sensitivity, reliability, initial and repeated costs, and potential interruption of business activities. Regarding method sensitivity and reliability, the SWRCB looked for a cost-effective method that was more sensitive than current monitoring techniques while maintaining the same reliability. The SWRCB believes that increased sensitivity is necessary to determine if single-walled underground storage tanks are leaking below the regulatory established monitoring sensitivities for the various single-walled monitoring methods. The SWRCB suspects such slow leaks may be occurring given that fuel leaks impacting soil and groundwater have been discovered (during removal) under, and around, many single-walled UST's with no record of any unauthorized releases in their monitoring history. Since 0.1 gph is currently the highest sensitivity required for leak detection monitoring in California, in order to achieve the above goal, the enhanced leak detection sensitivity is set at 0.05 gph, or less.

The California reliability standard (adopted from federal standard 40 CFR 280.40(a)(3)) is a leak detection monitoring performance standard for the probability of detection (PD) and probability of false-alarm (PFA). This standard is the same regardless of the method sensitivity established in the UST regulations and is set at 95% PD and 5% PFA (i.e. 95/5 reliability). Thus, statistical inventory reconciliation (SIR) which, by California regulation, has a sensitivity set at 0.2 gph, must meet the same reliability standard as a tank-tightness test which has a sensitivity set at 0.1 gph. The SWRCB also looked at additional aspects of monitoring method reliability, such as the method's ability to find the location of a leak, and its reliability in determining if detected leaks came from the tank and piping rather than spills and overfills, from prior tank operations, or other sources.

Only one of the proposed enhanced leak detection methods was able to meet all of the SWRCB requirements for enhanced leak detection. This was an external monitoring method using a benign chemical, with unique characteristics, introduced into the tank and monitored outside the tank system via a network of sensitive probes.

The internal monitoring methods proposed (i.e. automatic tank gauging and statistical inventory reconciliation) were unable to meet the reliability standard at a leak-rate sensitivity less than 0.1 gph. This was also true for the other proposed external methods (i.e. fuel vapor monitoring, ground water monitoring, and soil and ground water investigations). Additionally, these methods were unable to locate a leak or clearly determine if a fuel component came from the tank system, from spills and overfills, from previous tank operations, or other sources.

Subsection 2644.1(a)(3) codifies the provision in HSC 25292.4(a) that UST owners or operators, who are required to conduct enhanced leak detection, implement a program of enhanced leak detection by November 1, 2000. The November 1, 2000 deadline was not specified in the regulations since the UST owner or operator needs to first be identified by the SWRCB according to its Geographic Information System (GIS) mapping database, in order to know for certain their facility is located within 1,000 feet of a public drinking water well. A 36-month cycle for enhanced leak detection was chosen as a cost-effective compromise to a 12- or 24-month cycle. The SWRCB determined that a 12- or 24-month cycle would not provide additional protection of public drinking water wells commensurate with the added cost of enhanced leak detection.

Subsections 2644.1(a)(4) and (5) are needed in order to keep local agencies updated on the status of enhanced leak detection at the site, and to provide the results of the enhanced leak detection to the local agency and the SWRCB. With the exception of reporting the results to the SWRCB, these requirements are consistent with the current SWRCB notification and reporting requirements for tank/piping integrity testing (23 CCR, section 2643(g)).

Section 2660. General Applicability of Article

Subsection 2660(h) is amended to accommodate the new under-dispenser requirements for single-walled tank systems in accordance with HSC 25284.1(a)(5)(C).

Section 2666. Requirements for Upgrading Underground Piping.

The title of section 2666 is amended, and subsection 2666(e) is added, in order to implement the new under-dispenser requirements for single-walled tank systems in accordance with HSC 25284.1(a)(5)(C).

A. SUMMARY OF, AND RESPONSE TO, COMMENTS (45 DAY PERIOD)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

TABLE OF SWRCB RESPONSE TO COMMENTS
45-Day Comment Period (May 12 – July 18)

COMMENTERS

NUMBER	NAME
1	Afforda Test
2	Bravo Systems
3	California CUPA Forum
4	CIOMA
5	Equiva Services LLC, SH&E Compliance
6	Environmental Working Group
7	Exxon Mobil
8	Harmon, Brian
9	L.A. County Dept. of Public Works
10	Mosier Brothers Storage Tanks
11	Orange County Health Care Agency
12	Pasadena Fire Department
13	Pearson Equipment & Maintenance Company
14	Rock, Dennis
15	Southern California Edison
16	SPC (Parent to Pacific Bell et al)
17	Steel Tank Institute
18	Time Oil Company
19	Tracer Research Corporation
20	Veeder-Root Company
21	Western State Petroleum Association
22	White Environmental Associates

SUMMARY OF SWRCB RESPONSES TO COMMENTS ON PROPOSED SB 989 REGULATIONS
45-DAY COMMENT PERIOD (May 12 to July 18, 2000)
SORTED BY SECTION

Section / subject	Comment Number	Summary of comment	Response	Revision needed
2611 / definitions	S9 - 04	Proposed definition of "dispenser" may include emergency generator underground tank systems (and non motor vehicle tank systems),	**Rejected:** the proposed definition of a "dispenser" is accurate and consistent with related statute. Although most emergency systems do not have "dispensers" some might, if so designed.	None
2611, 2636, 2626.1 to 4	L5 - 02	Recommends changing "spill containment or control system" to "dispenser spill containment or control system"	**Accepted**	Revised relevant sections
2635 / tank installer training	LS 3- 05	Supports the additional tank installer training as proposed	**Supporting comment**	None
2635 / tank installer training	L5 - 03	Recommends amending section 2635(d)(1) to include periodicity of re-certification.	**Accepted**	Revised 2635(d) accordingly
2635 / tank installer training	L5 - 04	The effective date for the initial refresher training for currently certified installers needs to be clarified	**Accepted**	Revised 2635(d) accordingly
2635 / tank installer training	S10 - 02	The proposed recurrent training requirement for tank installers (section 2635(d)(1)) is unnecessary	**Rejected:** periodic installer re-certification is needed to help ensure adequate competency in installing ust's properly.	None
2635 / tank installer training	S12 - 01	The proposed regulations are inadequate to address the quality of the tank installation and maintenance of these systems. Suggests that manufacturers training programs be monitored and approved by the swrcb	**Rejected:** swrcb does not have the statutory authority to require manufacturers to obtain approval from the swrcb for tank installation training programs	None
2635 / tank installer training	L18 - 04	The proposed requirement for triennial re-certification of tank installers is unnecessary (except possibly for inexperienced installers).	Same comment as S10 - 02	Same
2635 / tank installer training	L18 - 05	The proposed rule would benefit by requiring a single provider of this training for all or most ust systems	**Rejected:** the manufacturer of the equipment being installed is the best source of training for that equipment	None
2635 / tank installer training	LS21 - 12	The language for tank installer training should be revised to require that the refresher certification occur at least every 36 months	**Accepted**	Revised 2635(d) accordingly
2635 / tank installer training	LS21 - 15	Recommends that the language be revised to require that the refresher certification for tank installers occur at least every 36 months	**Accepted**	Revised 2635 accordingly

2635 / tank installer training	LS22 - 06	Commenter 22 says that the proposed additional requirements for tank installer training should cover all activities related to repairs and upgrades under article 6.	**Rejected:** with respect to ust repairs, this activity is covered by proposed section 2637(b); regarding ust upgrades, qualification requirements are already specified in article 4 for the various types of upgrades, including lining and installation of bladders.	None
2636 / under dispenser containment	S2 - 02	Requests clarification regarding under-dispenser containment and asks if float-trip valve will be acceptable.	**Clarification:** the float trip valve is acceptable if the systems meets the pertinent requirements of 2636(f) or (g).	Revised Section 2636 (f) and (g) accordingly.
2636 / under dispenser containment	LS3 - 03	Requests a requirement that monitoring of udc be done using an audible and visual alarm system, rather than simply by a float-trip mechanism.	**Rejected:** Our experience has been that audible and visual alarms are just as prone to failure due to lack of maintenance, or tampering, as are mechanical float switches	None
2636 / under dispenser containment	L7 - 03	The language in subdivision 2636(h)(3) appears to prevent installation of any dispenser spill containment or control system unless it has been specifically approved by the swrcb.	**Rejected:** Subsection 2636(h)(3) specifically applies to dispenser spill containment or control systems that are separately defined in section 2611 from under-dispenser containment (UDC). Thus UDC systems may still be installed without SWRCB approval.	None
2636 / under dispenser containment	S14 - 02	The requirement for monitoring under-dispenser containment by an audible and visual alarm will be a huge burden to current owners of mechanical float switch systems	Same comment as S2 - 02	Same
2636 / under dispenser containment	LS15 - 01	The proposed regulations are not, but should be, drafted in consideration of nuclear power plants.	Not a comment on the proposed regulations	None
2636 / under dispenser containment	LS15 - 02	The proposed definition of "dispenser" should be clarified such that it may not be misinterpreted to include emergency generator fuel delivery systems	Same comment as S9 - 04	Same
2636 / under dispenser containment	S16 - 02	The underground storage tank systems that supply emergency generators don't need under-dispenser containment.	Same comment as S9 - 04	Same
2636 / under dispenser containment	L18 - 02	The swrcb should allow flexibility when approving under-dispenser containment system.	**Rejected:** the requested flexibility is already incorporated into subdivisions 2636(h)(3) and 2636.1 through 4	None
2636 / under dispenser	LS21 - 04	The january 2000 date included in the proposed regulations for under dispenser containment seems	**Rejected:** under-dispenser containment has been required systems installed after july 1, 1987 per	None

containment		at odds with current requirements and would be retroactive	health and safety code 25291(a)(7)(e), the new statutes simply clarify previous law.	
2636 / under dispenser containment	LS21 - 05	Under-dispenser monitoring systems that shut down the dispenser in the event of a leak should be allowed in lieu of monitoring by an audible and visual alarm	Same as comment S2 - 02	Same
2636 / under dispenser containment	LS21 - 06	the proposed requirement for approval by the swrcb of under-dispenser spill control or containment systems does not make allowance for third-party approval for acceptability	**Rejected:** the proposed regulations are clear regarding the two types of under-dispenser containment : 1) installed in accordance with proposed subsection 2636(h)(2); and 2) swrcb approved spill containment and control systems installed per proposed subsection 2636(h)(3).	None
2637 / secondary containment testing	L18 - 01	The requirements for secondary containment testing are too stringent since it is unlikely that both systems will fail simultaneously	**Rejected:** although the probability of the primary and secondary systems failing simultaneously is low, the probability of the secondary failing first, followed by the primary, is much higher.	None
2637 / annual maintenance Certification	L4 - 02	Proposed requirements will give manufacturers the ability to limit the number of contractors able to conduct the work.	**Rejected:** swrcb does not control how private firms do business. It is possible some manufacturers may limit certification of technicians, we have not heard of it to date.	None
2637 / annual maintenance certification	LS3 - 04	Supports the proposed regulations regarding annual monitoring maintenance inspector requirements.	**Supporting comment**	None
2637 / annual maintenance certification	S1 - 01	The new requirement for licensing of annual monitoring certification technicians is confusing, no apparent reason for it.	**Rejected:** the licensing requirements are mandated by law. The law was enacted in response to swrcb technical reports indicating deficient ust installations are causing leaks	None.
2637 / annual maintenance certification	S1 - 02	The licenses listed in the law and regulations are unrelated to the type of work conducted by service station annual maintenance technicians.	Not a comment on the proposed regulations.	None
2637 / annual maintenance certification	S1 - 04	Requests clarification as to whether the licensing requirements apply to the technician conducting the work or the contractor.	**Clarification:** the licensing requirements apply to persons responsible for the work. Employees of contractors holding a license do not personally need the license.	None.
2637 / annual maintenance certificaiton	L8 - 01	The Contractors state licensing board (cslb) has de-activated license c-61(d-40), one of the licenses listed as approved for annual monitoring maintenance inspectors.	Not a comment on the proposed regulations	None

2637 / annual maintenance certification	S1 - 03	The swrcb should request the contractors state licensing board (cslb) to provide a new license that is specific to annual monitoring maintenance work.	Not a comment on the regulations.	None
2637 / annual maintenance certification	S2 - 03	Requests clarification as to whether or not proposed requirements for annual monitoring maintenance inspectors applies to udc manufacturers	**Clarification:** health and safety code 25284.1(a)(4)(d) requires any person who installs, repairs, maintains, or calibrates monitoring equipment to be licensed and trained in accordance with swrcb regulations.	None
2637 / annual maintenance certification	L5 - 01	Section 2637(b)(1)(a) is not clear as to whether all of the licenses, or just one of the licenses, is required	**Clarification:** only one of the licenses is required. The swrcb believes that the current language is clear on this matter.	None
2637 / annual maintenance certification	L8 - 02	Commenter 8 believes it should be the company that is licensed to do the annual monitoring maintenance certifications, and not the employee., Otherwise could be a financial hardship for employees	Same as comment S1 - 04	None
2637 / annual maintenance certification	S9 - 03	Requests proposed regulations include a provision that allows the local agency to reset the schedule for the inspection so as to assure that staff will be present	**Rejected:** local agencies may request additional notification time if they believe it is necessary, without any additional provisions in the regulations.	None
2637 / annual maintenance certification	L13 - 01	Are certification programs offered by, or available from, all monitoring system manufacturers?	**Answer:** We believe that most manufacturers have training and certification programs related to the monitoring equipment they sell	None
2637 / annual maintenance certification	L13 - 02	Is January 1, 2002 the deadline by which the installer or maintenance technician must be certified?	**Answer:** January 1, 2002 is the date by which installation, calibration, maintenance, and annual certification of monitoring equipment must be done by a licensed and certified inspector	None
2637 / annual maintenance certification	L13 - 03	What about other related tank, piping, dispensing equipment manufacturers certification program availability?	**Answer:** Same answer as above	None
2637 / annual maintenance certification	L13 - 04	Some manufacturers of underground storage tank equipment will only train and certify certain select individuals or groups.	Same comment as L4 - 02	None
2637 / annual maintenance certification	LS21 - 13	The proposed requirement that owners/operators notify the local agency 48 hours in advance of conducting repairs should be revised to only require announcements for repairs that have already been scheduled	**Rejected:** providing a specific regulatory exemption for "scheduled repairs" would be ambiguous since owners or operators may classify almost any repair as unscheduled. Local agencies may waive requirement for emergency repairs	None

2637 / annual maintenance certification	LS21 - 14	The requirement for putting a tag or sticker on equipment that has been inspected should be replaced with a simpler tracking requirement	**Rejected:** we believe the tag/sticker method of tracking is reasonable and will at least show that the monitoring equipment was touched during the inspection.	None
2637 / annual maintenance certification	LS22 – 02	Recommends that leeway granted for the development, issuance and transfer to ust agencies of an electronic version of the "monitoring system certification form.	**Rejected:** the proposed regulations do not exclude the development, issuance, and transfer to ust agencies of an electronic version of the "monitoring system certification form."	None
2637 / secondary containment testing	LS21 - 02	Recommends that systems that cannot be tested but the owner/operator agrees to take the route of enhanced leak detection, the requirements should state that only one test is required	Same as comment L7 - 01	Same
2637 / secondary containment systems	LS17 - 02	Claims that monitorin methods that are exempt from periodic secondary containment systems rely on the owner/operator to regularly visually inspect equipment and there is no requirement for an alarm etc. To continuously detect leaks.	**Rejected:** Whether or not the monitoring method requires active participation by the owner or operator is moot provided that the monitoring system, including the necessary visual checks and the method of alarm, meets state requirements and has been approved by the local agency	None
2637 / secondary containment testing	S2 - 01	Clarify the type of periodic secondary containment testing that is acceptable to state and local agencies i.e. whether or not the test must be in accordance with the original manufacturers test or the test used at installation.	**Clarification:** the current proposed regulations require that secondary containment testing be conducted in accordance with manufacturer's guidelines and standards	None
2637 / secondary containment testing	LS3- 01	Supports proposed secondary containment testing requirements	**Supporting comment**	None
2637 / secondary containment testing	L7 - 01	The alternative to secondary containment testing (for systems not testable), identified in proposed subdivision 2637(a)(1) is unclear -- suggests another alternative.	**Accepted**	Revised 2637 with alternative similar to that suggested
2637 / secondary containment testing	L7 - 02	Subdivision 2637(a)(2) is inappropriately worded such that a local agency may decide to choose the secondary containment testing method	**Accepted**	Deleted the relevant provision

2637 / secondary containment testing	S9 - 01	The requirement for secondary containment testing six months after installation is unnecessary	**Rejected:** settlement commonly occurs in soil and/or backfill which may affect the ust installation. Most settlement occurs in the first six months	None
2637 / secondary containment testing	S9 - 02	Under dispenser containment may not be testable because many flexible couplings, hose clamps, and other fittings are buried beneath the under dispenser containment	**Rejected:** While it is true that some, if not many, secondary containment systems may not be testable as currently installed, they can modified for testing. Additionally, this testing is mandated by law.	None
2637 / secondary containment testing	S10 - 01	the requirement for triennial secondary containment testing for double-walled tanks is unnecessary	**Rejected:** the proposed requirement is both necessary, because it is required by newly enacted statutes of SB 989, and consistent with existing statutes.	None
2637 / secondary containment testing	L11 - 01	Allowing local agencies to decide on a test method for secondary containment testing may create inconsistencies	Same as comment L7 - 02	See l7 - 02
2637 / secondary containment testing	S14 - 01	Will any type of sensor that recognizes the intrusion of ground water or product into the interstitial space allow an exemption for that system from secondary containment testing?	**Answer:** A system monitored by a probe that recognizes the intrusion of water would only be exempt if the entire tank was continuously submerged in ground water.	None
2637 / secondary containment testing	S16 - 01	Secondary containment testing of double-walled underground storage tanks may be problematic,	**Accepted:** we agree that post-installation testing of secondary containment systems will present unique problems that did not exist during the test at installation.	Revised 2637(a)(2) to allow more flexibility in test methods
2637 / secondary containment testing	LS17 - 01	Periodic testing of secondary containment systems for ust's already installed will likely entail a considerable cost without much benefit	**Rejected:** we agree that many systems will need costly modification, but the benefits of testing out weigh costs	None
2637 / secondary containment testing	LS21 - 01	Suggests that where an owner/operator commits to replacement of the non-testable secondary containment system by a certain date advance of july 2005, should be exempt from the testing requirement.	Same as comment L7 - 01	Same
2637 / secondary containment	LS21 - 03	Revise 3637 to clearly state that the local agency can only specify the method if manufacturers guidelines, industry codes, or engineering standards	Same as comment L7 – 02	Same

testing		do not exist.		
2640 / enhanced leak detection	L7 - 04	Requests that siphon bars be included in the list of components not considered "single-walled."	**Rejected:** siphon bars are considered suction piping, and suction piping has already been listed as exempt.	None
2640 / enhanced leak detection	S9 - 07	Unsure about the timing and the type of data that will go into the enhanced leak detection database, and the nature and extent of conveying information back to the swrcb.	Not a comment on the regulations	None
2640 / enhanced leak detection	L11 - 03	Subdivision 2640(e) is unclear as to where the measurement will be taken to determine if a single-walled tank facility is within 1000 ft of a public drinking water well.	**Accepted**	Revised 2640(e) to detail location of measurement
2640 / enhanced leak detection	LS21 - 08	Recommends that "siphon piping" be included in the list of components not considered single-walled components in subdivision 2640(e)(1)	Same as comment L7 – 04	Same
2644.1 / enhanced leak detection	LS3 - 02	The frequency of enhanced leak detection should be the same as the frequency for tank integrity testing for single-walled underground tanks.	**Rejected:** benefits of annual enhanced leak detection do not outweigh added costs given the proposed method.	None
2644.1 / enhanced leak detection	L7 - 05	Requests that a performance based standard be substituted for the "prescriptive" standard set forth in the proposed subdivision 2644.1(a)(1) and (2).	**Rejected:** the enhanced leak detection standard in subdivision 2644.1(a)(1) and (2) is a performance standard that was selected because, in addition to the high sensitivity available by this method, it is also capable of finding the location of a leak	None
2644.1 / enhanced leak detection	S9 - 05	Because the enhanced leak detection method identified in the proposed regulations is proprietary, and takes place over several days, it is difficult for local agencies to verify the what is going on during the test	**Rejected:** workplans must be submitted to, and approved by, local agencies. Although some aspects are proprietary, those aspects are included in third party certification. Local agency can still follow crux of the test.	None
2644.1 / enhanced leak detection	S9 - 06	Asserts that, even though vent piping, and other components, are exempt from enhanced leak detection; they cannot be isolated thus causing false testing results.	**Rejected:** although unregulated vent piping and other components cannot be isolated from the ust system, the proposed enhanced leak detection method can detect leaks from these areas via probes near these components.	None
2644.1 / enhanced leak detection	S9 - 08	Expressed concern that the proposed method of enhanced leak detection could only be provided by one vendor and that there is no protocol for this method for the proposed 0.05 leak rate.	**Rejected:** see comments L20 – 01 and L7 – 05.	None

2644.1 / enhanced leak detection	L18 - 03	The swrcb should reconsider using tracers to meet the enhanced leak detection requirement because they are unreliable	**Rejected:** the provisions set forth in subdivision 2644.1(a)(2) ensure the reliability of the proposed method for enhanced leak detection	None
2644.1 / enhanced leak detection	L19 - 01	Since the lowest sensitivity for the proposed enhnaced leak detection method is 0.005 gallons per hour, the leak should be reduced to this sensitivity	**Accepted**	Revised 2644.1 to change leak rate to .005
2644.1 / enhanced leak detection	L20 - 01	Swrcb should consider giving owners and operators of underground storage tanks several options for enhanced leak detection	**Rejected:** the enhanced leak detection standard set forth in subdivision 2644.1(a)(1) and (2) was selected as best after evaluation of several other methods	None
2644.1 / enhanced leak detection	LS21 - 09	It is inappropriate for the state to impose any sort of requirement that can only be conducted by a single contractor.	Same as comment L20 - 01	Same
2644.1 / enhanced leak detection	LS21 - 10	The experience gained in doing field based research should be able to determine effectiveness of tracer method, the swrcb should delay mandating this method until results are in	**Rejected:** the investigative method being used for the field-based research is based on the known reliability and accuracy of that method at ust sites around the country	None
2644.1 / enhanced leak detection	LS21 - 11	A triennial frequency for enhanced leak detection is not unreasonable and that should be made clear in the proposed regulations	**Accepted**	Revised 2644.1 to require triennial testing
2644.1 / enhanced leak detection	LS21 - 16	A provision should be added to allow replacement of single walled components to obviate the need for testing	**Rejected:** replacement of single-walled components can be done without any new provisions being added to the regulations.	None
2644.1 / enhanced leak detection	LS22 - 03	Commenter 22 says the swrcb's reasoning in establishing the 0.05 leak detection rate for enhanced leak detection may be flawed.	**Rejected:** There are good reasons in seeking data obtained with a leak rate sensitivity lower than current routine monitoring, most important of which is to determine if UST's are leaking below the leak rate of the routine monitoring method..	None
2644.1 / enhanced leak detection	LS22 - 04	Expressed significant concern the proposed requirement for enhanced leak detection can only be met by one method, and perhaps one vendor.	Same as comment L20 - 01	None
2644.1 / enhanced leak detection	LS22 - 05	the swrcb did not require that enhanced leak detection be conducted periodically. Enhanced leak detection should be required no less than every 3 years between events.	Same as comment LS21 - 11	Same
None	LS22 - 07	Comments regarding local agency enforcement	Not comments on regulations	

None	LS 3- 06	Comments regarding underground storage tank facility inspection requirements	Not a comment on the regulations	None
None	L6 - 01	Submitted report entitled *"uncontrolled lusts: how california fails to protect our water from leaking underground storage tanks"* as comments	Not a comment on the regulations	None
None	L11 - 02	Fill pipes and vent/vapor lines should also be required to be secondarily contained for newly constructed systems.	Not a comment on the regulations.	None
None	L11 - 04	Comments regarding annual inspection requirements.	**Rejected:** not comments on the proposed regulations	None
None	LS21 - 07	Since the dates identified in subdivisions 2666(a)(b) and (c)(december 22, 1998) are behind us, the wording of these regulations should be expressed differently.	Not a comment on the proposed regulations	None
None	LS22 - 01	General comments	**Rejected:** not comments on proposed regulations	None
None / general comments	L4 - 01	Timing of the proposed regulations poses an unnecessary and costly burden to small business tank owners	**Rejected:** the regulations could not have been adopted prior to technical information that supported legislation	None

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
(Comments submitted between May 12 and July 18, 2000)

Comments to the proposed regulations to implement SB 989 were submitted both in writing and by oral testimony. The oral testimony was given at a public hearing conducted on July 18, 2000 in Alhambra, and documented in the transcript of proceedings (Transcript) for the hearing prepared by the court reporter. All of the written comments and oral testimony, relevant or not, are summarized below.

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments. If a commenter presented oral testimony at the public hearing the page number(s) where their respective comments can be found in the Transcript is given next to their name. Commenters with two dates identified presented written and oral testimony.

	NAME	DATE
1	Afforda Test (20 – 23):	July 18, 2000
2	Bravo Systems (12 – 14):	July 18, 2000
3	California CUPA Forum (47 – 52)	July 17, 18, 2000
4	CIOMA	July 18, 2000
5	Equiva Services LLC, SH&E Compliance	June 12, 2000
6	Environmental Working Group	July 18, 2000
7	Exxon Mobil	July 10, 2000
8	Harmon, Brian	June 9, 2000
9	L.A. County Dept. of Public Works (42 – 46)	July 18, 2000
10	Mosier Brothers Storage Tanks (15 – 16)	July 18, 2000
11	Orange County Health Care Agency	July 18, 2000
12	Pasadena Fire Department (39 - 41)	July 18, 2000
13	Pearson Equipment & Maintenance Company	July 17, 2000
14	Rock, Dennis (16 – 18)	July 18, 2000
15	Southern California Edison (36 – 38)	July 18, 2000
16	SPC (Parent to Pacific Bell et al) (55 – 56)	July 18, 2000
17	Steel Tank Institute (28 – 31)	July 11, 18, 2000
18	Time Oil Company	July 10, 2000
19	Tracer Research Corporation	July 3, 2000
20	Veeder-Root Company	July 18, 2000
21	Western State Petroleum Association (33 – 35)	July 12, 18, 2000
22	White Environmental Associates (52 – 54)	July 18, 2000

Each commenter's remarks are summarized below under the related subject matter, followed by the SWRCB response.

COMMENTER 1

Annual Maintenance Certification

Comment: Commenter 1 said that the new requirement for licensing of annual monitoring certification technicians (Monitoring Technicians) was confusing in that there was no apparent reason for it. S1 - 01

Additionally, Commenter 1 stated that the licenses listed in the law and regulations are unrelated to the type of work conducted by service station annual maintenance technicians. S1 - 02

Commenter 1 suggests that the SWRCB should request the Contractors State Licensing Board (CSLB) to provide a new license that is specific to annual monitoring maintenance work. S1 - 03

Finally, Commenter 1 requests clarification as to whether the licensing requirements apply to the technician conducting the work or the contractor. S1 - 04

Response:

S1 – 01: The licensing requirements for annual monitoring maintenance inspectors, and the list of acceptable contractors licenses for this work, were recommended to the legislature by the California Leak Monitoring (CALM) committee. This committee was formed by the SWRCB in response to complaints by local agencies regarding the quality of work performed by many annual monitoring maintenance inspectors.

Specifically, local agencies asserted that, because there are currently no required training standards and licensing requirements for annual monitoring maintenance inspectors, virtually anyone may do the work, and continue to do the work, despite poor performance and deceptive work practices. The CALM committee studied this issue and concluded that required training standards and licensing would improve the quality of work from annual monitoring maintenance inspectors and also hold them accountable under threat of license revocation.

Furthermore, another SWRCB panel (Advisory Panel on the Leak History of New and Upgraded UST Systems), assembled in response to a request by Governor Pete Wilson, determined that one of the prime causes of leaks from these systems was improper maintenance.

S1 – 02: Except for the limited specialty c61 license, which is no longer issued, we agree that the listed licenses are essentially unrelated to the type of work that is conducted during annual maintenance inspections. However, the listed licenses do provide an enforcement tool for local agencies to ensure quality work, and that was the prime reason for the legislation.

S1- 03: Not a comment on the proposed regulations.

S1 – 04: Article 2 of the Contractors State Licensing Board (CSLB) statutes defines "person" as "an individual, a firm, co-partnership, corporation, association or other organization, or any combination of any thereof." Since the licenses required for annual monitoring maintenance inspectors are issued by the CSLB, this definition applies. Therefore, the company may hold the license under the current proposed language.

Result: No changes..

COMMENTER 2:

Secondary Containment Testing

Comment: Commenter 2 requests that the SWRCB clarify the type of periodic secondary containment testing that is acceptable to state and local agencies. Specifically, whether or not the test must be in accordance with the original manufacturers test or the test used at installation. Commenter 2 asserts that, for sumps, the manufacturer's original test is a visual test. However, this commenter says that when it has approached local agencies regarding whether or not they would accept a visual test for periodic secondary containment, the local agencies have rejected the idea. Furthermore, Commenter 2 says that the test at installation is usually a hydrostatic test, with the containment area being filled above the highest penetration fitting, and this may involve over 300 gallons of water. Commenter 2 claims that if the hydrostatic test is used for periodic secondary containment testing, the water used for the test would become contaminated by residual fuel in the sumps and may impact soil beneath the sumps. S2 - 01

Response:

S2 – 01: The current proposed regulations require that secondary containment testing be conducted in accordance with manufacturer's guidelines and standards. We believe this language is sufficient to ensure that secondary containment testing is done properly and safely. This is because it allows manufacturers to develop procedures for periodic secondary containment testing rather than simply relying on the test procedures used for the single test at installation. However, we do believe the language should be revised to indicate that, whatever the procedure, the follow-up secondary containment testing must be done to the same test criteria (i.e. same leak detection limit) as that used at installation.

The secondary containment test procedures that are used must also be appropriate for the situation. While a visual test may be fine for a component that has not yet been installed, it may be inappropriate after it has been installed since not all parts of the component can be closely inspected. This is likely the reason why the local agencies rejected the proposed visual inspection.

We agree that water used for hydrostatic secondary containment testing may become contaminated and leak into the soil, or backfill, if the secondary containment component has a leak. However, precautions can be taken to minimize this hazard. Additionally, while the test may pose its own hazards, not testing the secondary containment obviously exposes the environment to continual leaks of pure fuel for those systems with leaks. We believe the overall benefit to the environment from hydrostatic secondary containment testing significantly outweighs the minimal risks involved.

Result: Subdivision 2637(a)(2) will be revised to require the secondary containment testing be conducted to the same test criteria as those used for the test at installation.

<u>**Under Dispenser Containment**</u>

Comment: Commenter 2 requests clarification regarding the type of leak detection equipment required in the proposed regulations for under dispenser containment (UDC). This commenter states that it has been manufacturing, and using as UDC leak detection, a float-trip mechanism which stops the flow of product when a dispenser leak occurs. Furthermore, the commenter asserts that this method of UDC monitoring has been accepted throughout California for several years as a type of audible/visual alarm in that a customer complaining about not getting fuel satisfies the audible/visual requirement. Commenter 2 also claims that the float-trip mechanism is superior to electronic audible/visual alarms because it does not rely on electricity for proper operation, and it stops the flow of product when a leak occurs. Essentially, Commenter 2 wants to know if the float-trip type of UDC monitoring will continue to be acceptable in California. S2 - 02

Response:

S2 – 02: We agree with Commenter 2 that under-dispenser containment leak detection methods and procedures need to be further clarified in the proposed regulations. Under-dispenser containment is secondary containment for the short portion of pressurized piping underneath the dispenser that is single-walled, and therefore is subject the same monitoring requirements as the remainder of the piping system for double-walled systems.

Health and Safety Code (HSC) Section 25291 requires that secondary containment shall be monitored by a continuous leak detection system with an **alarm**, and that pressurized piping shall be equipped with an automatic line leak detector and tightness tested annually (subdivisions 25291(a)(6), and (e). For single-walled systems that have under-dispenser containment, only the portion of the piping system that is double-walled (i.e. the piping that is secondarily contained by under-dispenser containment) is subject to the monitoring requirements for secondarily contained systems.

Current regulations that implement, clarify, and make specific the requirements of Health and Safety Code (Section 2636) require that piping monitoring systems activate an audible and visual alarm. This would seem to preclude, as indicated in the above comment, mechanical float switches as an acceptable method for under-dispenser containment monitoring. However, many local agencies have allowed these systems to be used for under-dispenser containment monitoring, with concurrence from the SWRCB, because they provide an effective means of preventing leaks under the dispenser by automatically shutting off fuel to the dispenser when a leak is detected. We believe this is just as effective an **"alarm"**, for this purpose, as an audible and visual alarm that may be tampered with, or ignored, allowing the leak to continue.

Result: The proposed regulations will be revised to clarify that mechanical float switches are acceptable as an alternative to an audible and visual alarm.

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 2 also requests clarification as to whether or not the new requirements for annual monitoring maintenance inspectors applies to the manufacturer of UDC equipment, including UDC monitoring equipment. S2 - 03

Response:

S2 – 03: Health and Safety Code 25284.1(a)(4)(D) requires any person who installs, repairs, maintains, or calibrates monitoring equipment to be licensed, and, be adequately trained in accordance with regulations adopted by the SWRCB. Therefore, if Commenter 2 conducts any of these activities they are subject to the new statutory requirements.

However, the proposed regulations were written such that only those who conduct annual monitoring system certification need to be licensed. Therefore, the proposed regulatory language will be revised to fully incorporate the requirements of the law.

Result: Section 2637(b) will be revised to require that persons who install, repair, maintain, or calibrate monitoring equipment be subject to licensing and training requirements set forth in the proposed regulations.

COMMENTER 3:

Secondary Containment Testing

Comment: Commenter 3, expressed support for the proposed secondary containment testing requirements saying that such testing is incredibly important. This is because, Commenter 3 asserts, even if the best monitoring system in the world is used to monitor secondary containment, it will be useless if there is a hole in the secondary containment that allows fuel to leak into the environment prior to reaching the probe. Additionally, Commenter 3 (representing a local agency), affirms that a visual secondary containment test (inspection) will be adequate for periodic secondary containment provided that the secondary containment system is removed from the ground for inspection. LS3 - 01

Response:

LS3 – 01: We agree with this supporting comment.

Result: No changes..

Enhanced Leak Detection

Comment: Commenter 3 acknowledges the need for enhanced leak detection because of the importance of drinking water aquifers and the fact that, in some areas, ground water is the sole source, or almost the sole source, of drinking water supply. In light of this, Commenter 3 asserts that the frequency of enhanced leak detection should be the same as the frequency for tank integrity testing for single-walled underground tanks.

Commenter 3 supports this assertion by noting that the only existing, third-party approved, method of enhanced leak detection (the method that meets all SWRCB requirements) is also approved for annual tank testing. Additionally, Commenter 3 points out that enhanced leak detection is only required for tank systems with the least amount of protection (single-walled systems) located in the most environmentally sensitive areas (near public wells). Given the above, Commenter 3 argues that enhanced leak detection should be done on an annual, instead of triennial, basis. LS3 - 02

Response:

LS3 – 02: We agree with Commenter 3 that a shorter time interval for enhanced leak detection would provide greater protection for public drinking water wells against fuel leaks from single-walled tanks than a longer time interval. However, the SWRCB chose an external monitoring method for enhanced leak detection because of its reliability, low detection limit, and accuracy in locating leaks. This monitoring method is costly in comparison to routine internal monitoring methods such as automatic tank gauging and statistical inventory reconciliation. Additionally, the number of vendors who currently can conduct this type of monitoring is limited. As such, the SWRCB determined that a requirement for more frequent enhanced leak detection using this external method would not be cost-effective, nor be practical in terms of implementation.

Result: No changes..

Under Dispenser Containment

Comment: Commenter 3 supports a requirement that monitoring of UDC be done using an audible and visual alarm system, rather than simply by a float-trip mechanism. Commenter 3 states that float-trip mechanisms are prone to failure due to improper maintenance, or collection of debris in the UDC, which may prevent the float from actuating in response to a leak. This is indicated, Commenter 3 claims, by the fact that 40 percent of the float-trip mechanisms in its jurisdiction are not functioning properly.

Additionally, Commenter 3 notes that fuel that collects in UDC will likely be a fire hazard and thus pose a hazard to customers pumping gas nearby, especially in the case of a three compartment UDC box. In this case, Commenter three asserts, one compartment may contain fuel that has leaked until the pump was shut-off, but the other two pumps may still be LS3 - 03 functioning (and continued to be used by customers) because fuel did not over flow into those compartments and shut-off the other pumps.

Given the above scenarios, Commenter 3 says that an audible and visual alarm, coupled with automatic shut-off, will be more effective, and safer, than float-trip mechanisms. This is because, Commenter 3 alleges, a loud audible alarm, combined with the fuel shut-off, will demand immediate attention by the fuel station operator, thus minimizing the fire hazard of collected fuel in the UDC.

Response:

LS3 – 03: California underground storage tank construction and monitoring regulations represent minimum state requirements that the SWRCB believes adequately implement related statutes and cost-effectively protect groundwater from leaking fuel tanks. These requirements assume that mandated equipment is installed and maintained properly. No technology can overcome deficiencies in these two areas and still perform as required. Thus, we believe that audible and visual alarms are just as prone to failure due to lack of maintenance, or tampering, as are mechanical float switches.

Regarding the collection of fuel in under-dispenser pans, this will only occur in the unlikely situation where the main piping secondary containment is sealed off from the dispenser pan, and, the leak occurs between the double-walled main piping and the dispenser shear valve. Although unlikely, we are aware of leaks under these conditions where fuel has collected in, and overflowed, the dispenser pan. However, this situation is essentially an explosion and fire hazard and thus best dealt with through local fire codes rather than water quality regulations.

We believe that requiring an audible and visual alarm, and dispenser shut-off, is excessive regulation and contrary to past practices that have been allowed by local agencies, with concurrence from the SWRCB, for years (see Commenter 2). Additionally, Health and Safety Code subsection 25291(a)(6), which provides the statutory authority for under-dispenser monitoring, only requires that secondary containment be equipped with an alarm to indicate a leak. Requiring both an audible and visual alarm, and, dispenser shut-off, would likely exceed this authority.

Result: No changes.

<u>**Annual Monitoring Maintenance Inspector Requirements**</u>

Comment: Commenter 3 supports the proposed regulations regarding Annual Monitoring Maintenance Inspector Requirements. Commenter 3 says that currently many of these inspectors do not have any training and that any one of us can legally do the annual inspections, as such, these inspections may be conducted improperly. Furthermore, Commenter 3 says that these inspections are important to verify that monitoring equipment is properly operating. LS3 - 04

Response:

LS3 – 04: The SWRCB agrees with these supporting comments.

Result: No changes.

Tank Installer Training

Comment: Commenter 3 states that it is not uncommon for mistakes to be made during the installation of underground storage tank, and that these mistakes are made by business that have installing underground tanks for years. Because of this, Commenter 3 asserts that the additional tank installer training is necessary. LS3 - 05

Response:

LS3 – 05: The SWRCB agrees with these supporting comments.

Result: No changes.

Other Comments:

Comment: Commenter 3 also made comments regarding the underground storage tank facility inspection requirements incorporated into Senate Bill 989 (supporting legislation for the proposed regulations). LS3 - 06

Response:

LS3 – 06: Not a comment on the proposèd regulations..

Result: No changes.

COMMENTER 4:

General Comments

Commenter 4 says that timing of the proposed regulations poses an unnecessary and costly burden to small business tank owners given that they just recently had to comply with the December 22, 1998 underground storage tank upgrade requirements. Commenter 4 claims that the state should have discovered the need for the new regulations earlier so that they could have been incorporated in the 10 year upgrade period, thereby making it easier for tank owners to comply all at once, rather than in frequent, and unexpected, iterations. This is especially the case, Commenter 4 asserts, with respect to the proposed requirements for sécondary containment testing and installation of under-dispenser containment. Commenter 4 says that the cost of complying with these requirements will be much higher than they would have been had tank owners know of the requirements during the 10 year upgrade period. Additionally, Commenter 4 L4 - 01 says tank owners will once again have to shut-down operations to comply with the new requirements.

Response

L4 – 01: The December 22, 1998 upgrade requirements were federally mandated in December 1988 primarily in an effort to minimize leaks from single-walled underground storage tank caused by corrosion of the steel components of those systems. California's upgrade requirements were slightly more stringent in that single-walled steel tanks were required to have both cathodic protection and internal lining, rather than either one alone.

The requirement for under-dispenser containment is the only part of the proposed regulations that might have been incorporated into the upgrade requirements for single-walled tank systems. The proposed requirements for tank installers and annual monitoring maintenance inspectors do not affect tank owners and operators, secondary containment testing relates to double-walled systems, and enhanced leak detection is a periodic testing requirement, and not a system upgrade.

Under-dispenser containment has been a requirement for double-walled systems since July 1, 1987. The legislature decided to also require under-dispenser containment for single-walled systems in response the January, 1999 findings of the Governor's advisory panel on the leak history of new and upgraded underground storage tank systems. These included a finding that fuel leaks from under the dispenser compose a disproportionate number of unauthorized releases. Given the above, the SWRCB could not have justified including the under-dispenser containment with the upgrade requirements because there was insufficient data to support the requirement.

Result: No changes.

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 4 is also concerned about the proposed training and licensing requirements for annual monitoring maintenance inspectors. In addition to the increased costs for the annual inspections, Commenter 4 states that the proposed requirements will give manufacturers the ability to limit the number of contractors able to conduct the work. Commenter 4 says this may further increase costs when the supply of licensed and certified annual monitoring maintenance inspectors fails to meet demand. L4 - 02

Response:

L4 – 02: The SWRCB does not have any control over how private firms conduct business. While it is certainly possible that some manufacturers may limit the number of technicians it certifies, we have not heard of this practice to date. The proposed regulations implement and interpret statute, and the SWRCB believes that certification, and re-certification from the equipment manufacturer are best means by which to comply with statute by ensuring that annual monitoring maintenance inspectors are adequately trained.

Result: No changes.

COMMENTER 5

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 5 says that Section 2637(b)(1)(A) is not clear as to whether all of the licenses, or just one of the licenses, is required to meet the licensing requirements for annual monitoring maintenance inspectors. Commenter 5 recommends adding "or" between each license listed for clarification. L5 - 01

Response:

L5 – 01: Only one of the licenses is required. The SWRCB believes that the current language is clear on this matter as the word "or" is only needed once in a sentence to indicate singular rather than plural.

Result: No changes.

Under Dispenser Containment

Commenter 5 recommends changing "Spill Containment or Control System" to "Dispenser Spill Containment or Control System", in sections 2611, 2636.1, 2636.2, and 2636.4. L5 - 02

Response:

L5 – 02: We agree with this comment.

Result: The proposed regulations will be revised accordingly

Tank Installer Training

Comment: Commenter 5 recommends amending Section 2635(d)(1) to read as follows:

> The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers~~;~~. **This certification must be renewed every 36 months ~~upon~~ by completion of refresher training provided by the manufacturer.** L5 - 03

Commenter 5 also says that the effective date for the initial refresher training for currently certified installers needs to be clarified. L5 - 04

Response:

L5 – 03, L5 – 04: We agree with these comments.

Result: The proposed regulations will be revised to incorporate the above recommendations, or similar language.

COMMENTER 6

General Comments: Commenter 6 submitted a report entitled "*Uncontrolled Lusts: How California Fails to Protect Our Water From Leaking Underground Storage Tanks*" as comments to the proposed regulations. This report documents a study conducted by Commenter 6 on the historical performance of the SWRCB and the Regional Water Quality Control Boards with respect to enforcing the cleanup of leaking underground storage tanks. L6 - 01

Response:

L6 – 01: The SWRCB could not find any specific comments relating to the proposed regulations in the subject report. Not a comment on the proposed regulations.

Result: No changes.

COMMENTER 7

<u>**Secondary Containment Testing**</u>

Comment: Commenter 7 says that the alternative to secondary containment testing (for systems not testable), identified in proposed subdivision 2637(a)(1) is unclear with respect to when the alternative testing must be conducted, the required frequency, and who makes the decision that a particular system is not testable. Additionally, Commenter 6 asserts that the alternative to secondary containment testing would be unnecessary if the secondary containment system was replaced with a testable system well before the July 1, 2005 deadline for replacement for non-testable systems. L7 - 01

Commenter 7 suggests that the alternative testing method be required once by December 31, 2003, unless the system is replaced by that date, in which case no alternative test need be required. Furthermore, Commenter 6 suggests that the owner/operator be allowed to determine whether or not their secondary containment system is testable, given the owner/operator's unique knowledge gained from operation and maintenance of the system.

Commenter 7 also says that subdivision 2637(a)(2) is worded such that a local agency may decide to choose the secondary containment testing method even in cases where there are manufacturers guidelines and standards, industry code, or engineering standard for the system being tested. Commenter 6 recommends that this subdivision be revised to clearly indicate that the need for local agency approval only applies if there is no applicable test method specified by the manufacturer or in an industry code or engineering standard. L7 - 02

Response:

L7 – 01, L7 – 02: We agree with Commenter 7 on all points contended, and will revise the proposed regulations accordingly. However, we will set the deadline for replacement of non-testable systems where enhanced leak detection is not performed, at December 31, 2002. This deadline is chosen because it corresponds with the phase-out deadline for MTBE but still provides sufficient time to replace the system.

Result: New Section 2637 will be revised to: 1) specifically allow the owner or operator to determine if the secondary containment system is untestable; 2) change the deadline for removal of untestable systems where enhanced leak detection is not conducted, to December 31, 2002; and 3) delete the provision that allows the local agency to determine the secondary containment test method.

__Under Dispenser Containment__

Comment: Commenter 7 states that the language in subdivision 2636(h)(3) appears to potentially prevent an owner/operator from installing any dispenser spill containment or control system unless it has been specifically approved by the SWRCB. As such, Commenter 6 suggests that the language be changed to clearly distinguish between third-party approved systems and new systems (i.e. alternative systems). L7 - 03

Response:

L7 – 03: The SWRCB disagrees with this comment. Subsection 2636(h)(3) specifically applies to under-dispenser ***spill containment or control systems*** which are separately defined in section 2611 from ***under-dispenser containment***. It is only under-dispenser spill containment and control systems that need SWRCB approval, therefore no further clarification is necessary.

Result: No changes.

__Enhanced Leak Detection__

Comment: Regarding subdivision 2640(e)(1), Commenter 6 requests that siphon bars be included in the list of components not considered "single-walled." L7 - 04

Additionally, Commenter 7 requests that a performance based standard be substituted for the "prescriptive" standard set forth in the proposed subdivision 2644.1(a)(1) and (2). Commenter 6 claims that the only test method that could comply with the enhanced leak detection requirements is the tracer-based method licensed by Tracer Technologies. Furthermore, Commenter 6 asserts that tank and line integrity test methods can be third-party certified to meet the performance standards set forth in subdivision 2644.1(a)(2). L7 - 05

Given the above, Commenter 7 recommends that the SWRCB eliminate subdivision 2644.1(a)(1) and retain subdivision 2644.1(a)(2) as the performance standard for enhanced leak detection. Commenter 7 argues that the establishment of a performance standard will provide more flexibility to industry and encourage the development of less costly alternatives for enhanced leak detection.

Response:

L7 – 04: Regarding siphon bars, these components are considered suction piping, and suction piping has already been listed in the proposed regulations as exempt from consideration as a single-walled component. Therefore there is no reason to specifically list siphon bars.

L7 – 05: The enhanced leak detection standard set forth in subdivision 2644.1(a)(1) and (2) is a performance standard that was selected because, in addition to the high sensitivity available by this method, it is also capable of determining the location of a leak. Internal methods, such as automatic tank gauges or SIR, do not have this capability regardless of their sensitivity capability. This is very important to the tank owner/operator since finding a leak may be very costly if there is no evidence pointing to its approximate location within the system.

Result: No changes.

COMMENTER 8

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 8 states that Contractors State Licensing Board (CSLB) had de-activated license C-61(D-40), which is one of the licenses listed as approved for annual monitoring maintenance inspectors. Commenter 8 further says if annual monitoring maintenance inspectors must be licensed this could be a financial hardship because some of Commenter 8's employees may not be able to get the license because they cannot afford and/or qualify for the bonds that are required. L8 - 01

Commenter 8 believes it should be the company that is licensed to do the annual monitoring maintenance certifications, and not the employee. As long as the employee maintains the manufacturers certification and the company maintains the license requirements, Commenter 8 asserts, the individual should be able to conduct the monitoring system certification. L8 - 02

Response:

L8 – 01: Except for the limited specialty C61 license, which is no longer issued, we agree that the listed licenses are essentially unrelated to the type of work that is conducted during annual maintenance inspections. However, the listed licenses do provide an enforcement tool for local agencies to ensure quality work, and that was the prime reason for the legislation.

We agree that annual monitoring maintenance inspectors will incur some financial hardship in obtaining a contractors license, however, many will not have to get the license if they work for a contractor that has one (see response to L8-02).

L8 – 02: Article 2 of the Contractors State Licensing Board (CSLB) statutes defines "person" as "an individual, a firm, co-partnership, corporation, association or other organization, or any combination of any thereof." Since the licenses required for annual monitoring maintenance inspectors are issued by the CSLB, this definition applies. Therefore, the company may hold the license under the current proposed language.

Result: No changes..

COMMENTER 9

<u>**Secondary Containment Testing**</u>

Comment: Commenter 9 contends that the requirement for secondary containment testing six months after installation is unnecessary and imposes an additional inspection for local agencies to conduct on top of all of their other work. Furthermore, Commenter 9 says that local agencies are lucky if they even get the paperwork for the secondary containment test at installation within 6 months of the installation. S9 - 01

Additionally, Commenter 9 points out that under dispenser containment may not be testable because many flexible couplings, hose clamps, and other fittings are buried beneath the under dispenser containment. Because of this, Commenter 9 asserts, these components may degrade in this environment without detection and eventually fail. S9 - 02

Response:

S9 – 01: The requirement for an additional test six months after installation is based on the fact settlement commonly occurs in soil and/or backfill which may affect the recently installed UST system. Most of this settlement occurs in the first six months after installation.

While it may be true that many local agencies do not even receive the paper work for the installation testing within six months of the installation date, this point is irrelevant to issue of whether or not the six-month test is necessary.

S9 – 02: Regarding the testability of under-dispenser secondary containment systems, we agree that some, if not many, secondary containment systems will need to be modified in order to be accurately tested. The SWRCB, local agencies, and industry will need to coordinate efforts to overcome the initial problems that are bound to occur during the first phase of periodic testing.

Result: No changes..

<u>**Annual Monitoring Maintenance Inspector Requirements**</u>

Comment: Commenter 9 claims that the 48 hour notification of local agencies prior to conducting the annual inspection may not be sufficient for local agencies to schedule a visit during that time. Commenter 9 requests that the proposed regulations include a provision that S9 - 03 allows the local agency to reset the schedule for the inspection so as to assure that staff will be present.

Response:

S9 – 03: The requirement for notification of the local agency by the owner or operator at least 48 hours prior to conducting annual inspections is the minimum state requirement. Local agencies may request additional notification time if they believe it is necessary, without any additional provisions in the regulations.

Result: No changes.

Under Dispenser Containment

Comment: Commenter 9 expressed concern that the proposed definition of "Dispenser" may include emergency generator underground tank systems (and non motor vehicle tank systems), whereby the system pumps up to a day tank, or possibly directly to the receiving equipment, and there essentially is no dispenser. This may, Commenter 9 postulates, impose an unnecessary requirement for under dispenser containment for equipment that the law, and proposed regulations, did not intend. Commenter 9 says that such systems in its jurisdiction have historically not been addressed as dispensers, but may be considered such if the proposed definition is adopted. S9 - 04

Response:

S9 – 04: The proposed definition of "dispenser" is derived from the definition of "pipe" in Health and Safety Code section 25281.5. "Pipe" is defined to include "valves and other appurtenances connected to the pipe, pumping units, fabricated assemblies associated with pumping units, and metering and delivery stations and fabricated assemblies therein…" Therefore, we believe the proposed definition of a "dispenser" is accurate and consistent with related statute.

There are two key reasons why under-dispenser containment is required: 1) it provides secondary containment for the short section of double-walled systems where the piping becomes single-walled in order to facilitate its connection to the dispenser; and 2) it provides secondary containment for an area of single-walled systems that is known to be a frequent source of leaks, either from the connection itself, or from careless exchange of dispenser filters. Clearly, an underground storage tank that supplies fuel to an emergency generator does not have a dispenser in the "classic" sense that most people, including regulators, understand it – i.e. a device that delivers fuel to a receiving tank that is outside the tank and piping system.

An emergency generator is, for all intents and purposes, part of the underground tank system itself, wherein the fuel from the tank is simply transferred directly to the generator through the piping system when needed. Furthermore, we are not aware of any connection points in these systems, related to the dispensing of fuel from the tank to the generator, that are weak areas similar to those found in single-walled systems supplying fuel for vehicles. Nor are we aware of dispenser filters that are periodically changed on these systems where careless procedures may repeatedly spill fuel onto the same spot on the ground. However, these may apply to some emergency generator systems, in which case, depending on the design of the system, under-dispenser containment may be required. It will be up to the local agency to determine how the proposed under-dispenser containment requirements apply to individual underground storage tank systems that supply fuel to emergency generators.

Result: No changes..

Enhanced Leak Detection

Comment: Commenter 9 says that because the enhanced leak detection method identified in the proposed regulations is proprietary, and because it takes place over several days, it is difficult for local agencies to verify the what is going on during the test. S9 - 05

Additionally, Commenter 9 asserts that, even though vent piping, and other components, are exempt from enhanced leak detection, they cannot be isolated. As such, Commenter 9 explains, the results of the test may falsely indicate (false-positive) that the tank or piping system is leaking, when actually the leaking "tracer" unknowingly came from come from one of the exempted components of the system. S9 - 06

Commenter 9 also expressed concern about the database that will be used for identification of underground storage tank facilities that will be required to conduct enhanced leak detection (those within 1000 ft of a public drinking water well). Specifically Commenter 9 is unsure about the timing and the type of data that will go into the database, and the nature and extent of conveying information back to the SWRCB. S9 - 07

Finally, Commenter 9 expressed concern that the proposed method of enhanced leak detection could only be provided by one vendor and that there is no protocol for this method for the proposed 0.05 leak rate. S9 - 08

Response:

S9 – 05: Local agencies will be able to track the progress of the test, and verify that the test is implemented properly, by carefully evaluating and approving the workplan prior to the test, and by site inspections during the test. Local agencies also may evaluate the third-party documentation for additional assurance.

S9 – 06: Although vent piping and other components that are not regulated cannot be isolated from the underground storage tank system which stores and transmits fuel, the proposed enhanced leak detection method can detect leaks from these areas by placing probes near these components. The results of the test will then determine whether or not the leak came from these unregulated UST components.

S9 – 07: Not a comment on the proposed regulations.

S9 – 08: Regarding the sole source issue, the SWRCB recognizes that the enhanced leak detection standards set forth in subdivision 2644.1(a)(2) are stringent and may currently be achievable through the use of only one technology, however the regulation does not mandate the use of any particular technology. (See *Rybachek v. U.S. Environmental Protection Agency*, (9th cir. 1990) 904 F.2d 1276, 1298 (finding that the United States Environmental Protection Agency's setting of zero-discharge limitations on wastewater used in placer mining did not mandate the use of any particular technology, even though the standards were stringent and might be achievable only through the use of certain technology).)

Regarding the testing protocol for a 0.05 leak detection rate, the provisions set forth in subdivision 2644.1(a)(2) ensure the reliability of the proposed method for enhanced leak detection by requiring that the method be third party certified and be capable of detecting the proposed leak rate with a 95% probability of detection and a 5% probability of a false alarm.

Result: No changes..

COMMENTER 10

Secondary Containment Testing

Comment: Commenter 10 says that the requirement for triennial secondary containment testing for double-walled tanks is unnecessary. This is because, Commenter 10 asserts, a small hole in the top of the secondary containment will never be a problem, yet the secondary containment test will fail in this situation. Commenter 10 does acknowledge that secondary containment associated with pressurized piping and related components does need to be tested because of the complexities of these systems. S10 - 01

Response:

S10 – 01: Although a small hole in the top of an underground tank with a "double-complete shell" that is monitored by a probe placed at the lowest point of the system is not likely to be threat to the environment (if the probe is functioning properly), such a system is in violation of the law and must be repaired. Secondarily contained underground storage tanks are required to be constructed such that they can contain at least 100% of the volume of the primary container (Health and Safety Code section 25291(a)(3)). If a hole exists anywhere in a tank system with a "double-complete shell", the system would then be in violation of the law since fuel would leak out this hole before 100% of the tank volume is contained. Therefore, the proposed requirement is both necessary, because it is required by newly enacted statutes of SB 989, and consistent with existing statutes.

Result: No changes..

Tank Installer Training

Comment: Commenter 10 contends that the proposed recurrent training requirement for tank installers (section 2635(d)(1)) is unnecessary. This is because, Commenter 10 asserts, underground storage tank technology has not, and probably will not, change much over the years, and thus the methods for installing these tanks essentially remains the same. Commenter 10 says that, simply put, underground storage tanks are set in the ground, compacted, and backfilled. Therefore, there are no new methods or techniques for installers to learn every three years. S10 - 02

Commenter 10 states that a lot of the re-training is occurring voluntarily and that it is not in the best interest of a tank installer to be part of a bad installation. Furthermore, Commenter 10 says that tank installers all work pretty hard to ensure that the tank installation is done correctly, without the need for a legal requirement for re-training.

Commenter 10 acknowledges that piping and related equipment do change frequently enough to require continuous refresher courses.

Response:

S10 – 02: Health and Safety Code 25284.1(a)(4)(A) mandates the SWRCB to adopt regulations requiring underground storage tank installers to meet minimum training standards. The proposed minimum standards set forth by the SWRCB are largely based on the SWRCB advisory panel report "Leak History of New and Upgraded UST Systems" which indicates that installation errors account for many of the leaks found in new and upgraded systems. Therefore, periodic installer re-certification is needed to help ensure adequate competency in installing UST's properly.

Result: No changes..

COMMENTER 11

Secondary Containment Testing

Comment: Referring to proposed subdivision 2637(a)(2), Commenter 11 says that allowing local agencies to decide on a test method for secondary containment testing may create inconsistencies throughout the state. Commenter 11 recommends that only the SWRCB act as the source of approval for test methods. L11 - 01

Response:

L11 – 01: We agree with this comment.

Result: See "Commenter 6."

Under Dispenser Containment

Comment: Commenter 11 says that, in addition to the proposed requirement for under-dispenser containment, fill pipes and vent/vapor lines should also be required to be secondarily contained for newly constructed systems. L11 - 02

Response:

L11 – 02: This is not a comment on the regulations. Additionally a statutory change would be needed to implement this request.

Enhanced Leak Detection

Comment: Commenter 11 states that subdivision 2640(e) is unclear as to where the measurement will be taken to determine if a single-walled tank facility is within 1000 ft of a public drinking water well. This is important, Commenter 11 notes, because underground storage tank owner/operators and local agencies may disagree on which sites qualify for the enhanced leak detection requirement due to differing beliefs regarding the appropriate point at the facility where the measurement should be taken (i.e. distance from well to property line, tank system, single-walled component etc). L11 - 03

Response:

L11 – 03: We agree with this comment.

Result: Subsection 2640(e)(3) will be revised to require a demonstration that the center of the well head is more than 1000 ft from the closest component of the UST system, for those SWRCB enhanced leak detection notifications that are appealed.

Other Comments

Comment: Commenter 11 commented on the requirement in SB 989 that UST facilities be inspected by local agencies every year instead of every three years. L11 - 04

Response:

L11 – 04: Not a comment on the proposed regulations.

Result: No changes.

COMMENTER 12

Tank Installer Training / Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 12 says that the proposed regulations are inadequate to address the number one performance indicator of underground storage tank systems – the quality of the installation and maintenance of these systems. The proposed regulations are inadequate, Commenter 12 asserts, because they still rely on the manufacturer of the equipment to provide the training, and this training may be insufficient to cover the complexities of tank installations and maintenance.

Commenter 12 points out that, while there are many good tank installer/tester contractors, there also many who do not understand the equipment and its limitations, nor do they understand state regulations as they relate to the installation. Rather, they follow a checklist, and if the tank system being installed or tested does not fit the parameters of that checklist, the installation may be deficient.

Commenter 12 recommends that the SWRCB impose additional quality control and quality assurance measures or procedures on individuals who will be installing, testing, and maintaining underground storage tank systems. Specifically, Commenter 10 suggests that manufacturers training programs be monitored and approved by the SWRCB to ensure the quality and effectiveness of these programs, and to get beyond the "checklist" mentality. S12 - 01

Response:

S12 – 01: Currently the SWRCB does not have the statutory authority to require manufacturers to obtain approval from the SWRCB for tank installation training programs. However, the SWRCB has assembled a panel of experts from government and industry to develop industry guidelines for such training. Although these guidelines will only be advisory, they should improve the quality of training provided by manufacturers.

Result: No changes..

COMMENTER 13

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 13 expressed concern regarding subdivision 2637(b)(1)(B) and (C) with respect to the following questions and issues:

1. Are certification programs offered by, or available from, all monitoring system manufacturers? L 13 - 01

2. If so, Is January 1, 2002 the deadline by which the installer or maintenance technician must be certified? L13 - 02

3. What about other related tank, piping, dispensing equipment manufacturers certification program availability? L13 - 03

Commenter 13 also claims that some manufacturers of underground storage tank equipment will only train and certify certain select individuals or groups. Additionally, these certified persons may be required by the manufacturer to provide 24 hour maintenance service. If the proposed regulations are adopted as written, Commenter 13 asserts, they may allow manufacturers of monitoring equipment to control which companies will, or will not, receive the necessary certification training and authorization to conduct annual monitoring maintenance certification. L13 - 04

Commenter 13 recommends that the SWRCB require that all manufacturers of regulatory approved monitoring system equipment and related components offer, or make available, system certification training to any company properly licensed and qualified to provide maintenance services. Furthermore, Commenter 13 argues, this training should be provided without bias or unfair requirements as a condition of the certification.

Response:

L13 – 01: Regarding question 1, we believe that most manufacturers have training and certification programs related to the monitoring equipment they sell. For those manufacturers that don't, they will need to develop certification programs so that the equipment they sell can legally be repaired and maintained.

L13 – 02: Regarding question 2, January 1, 2002 is the date by which installation, calibration, maintenance, and annual certification of monitoring equipment must be done by a licensed and certified inspector. Inspectors may be licensed and certified at any time.

L13 – 03, L13 – 04: Regarding the additional comments, the SWRCB does not have any control over how private firms conduct business. While it is certainly possible that some manufacturers may limit the number of technicians it certifies, we have not heard of this practice to date. The proposed regulations implement and interpret statute, and the SWRCB believes that certification, and re-certification from the equipment manufacturer are best means by which to comply with statute by ensuring that annual monitoring maintenance inspectors are adequately trained.

Result: No changes.

COMMENTER 14

<u>Secondary Containment Testing</u>

Comment: Commenter 14 asked whether or not any type of sensor that recognizes the intrusion of ground water or product into the interstitial space of the secondary containment, would allow an exemption for that system from secondary containment testing. S14 - 01

Response:

S14 – 01: The only monitoring systems that are exempt from periodic secondary containment testing are those systems that automatically and continuously test the secondary containment by virtue of their design, such as hydrostatic and air pressure/vacuum systems. A secondary containment system monitored by an interstitial probe that recognizes the intrusion of water would only be exempt if the entire tank was continuously submerged in ground water. Additionally, nearby monitoring wells would need to be installed to assure continuous submersion.

Result: No changes.

Under Dispenser Containment

Comment: Commenter 14 says that the requirement for monitoring under-dispenser containment by an audible and visual alarm will necessitate installation of electrical conduit for dispenser pans that currently use the mechanical float shut-off switch. Commenter 14 asserts that in order to properly retrofit electrical conduit into a dispenser pan, the dispenser will have to removed and the integrity of the pan breached by the drilling of a new hole to accommodate the conduit, and the hole must then be made water-tight.

Furthermore, Commenter 14 states that the new electrical sensor will be almost useless because it will likely need to be installed above the float switch, since there is no room in the float bowl. L14 - 02
As such, the mechanical float shut-off switch will activate and stop the leak prior to the leaking fuel rising high enough to trigger the electrical sensor. Finally, Commenter 14 claims that owners and operators may not have a monitoring panel that will accept the new electronic sensor and they would have to purchase another panel. This, Commenter 14 states, would be a huge burden given the owners and operators recently spent a lot money upgrading their systems to meet the December 22, 1998 upgrade requirements.

Given the above, Commenter 14 claims that the additional expenses incurred by the owner/operator to install the electronic sensor will be wasted because ultimately nothing is accomplished by installation of an ineffective electronic sensor.

Response: We agree with this comment. See Commenter 2 , "Under-dispenser Containment."

Result: Commenter 2 , "Under-dispenser Containment."

COMMENTER 15

General Comments

Comment: Commenter 15 says that the proposed regulations, like the legislation that mandates them, are not drafted in consideration of nuclear power plants. Commenter 15 states the U.S. EPA, in recognition of strict UST construction requirements and oversight by the Nuclear Regulatory Commission, specifically exempted underground storage tanks serving emergency L15 - 01 generators at nuclear power-plant facilities from federal underground storage tank regulations. As such, Commenter 15 urges California to adopt this federal standard, as have 48 other states, by amending the definition of "motor vehicle fuel tank" to exclude emergency generators that serve nuclear power-plant facilities.

Response:

L15 – 01: This is a request for a statutory change, and not a comment on the regulations.

Result: No changes.

__**Under-Dispenser Containment / Enhanced Leak Detection**__

Comment: Commenter 15 says that the proposed definition of "dispenser" should be clarified such that it may not be misinterpreted to include emergency generator fuel delivery systems that are not designed to be disconnected and re-connected such as at vehicle fueling or fuel transferring facilities. Or alternatively, Commenter 15 suggests that a specific exemption from the requirement for under-dispenser containment for UST systems supply fuel to emergency generators at nuclear plants. Commenter 15 recommends a similar exemption from the requirement for enhanced leak detection for emergency generator UST systems at nuclear power plants. L15 - 02

Response:

L15 – 02: See the response for a similar comment submitted by "Commenter9."

Result: No changes.

COMMENTER 16

__**Secondary Containment Testing**__

Comment: Commenter 16 says that secondary containment testing of double-walled underground storage tanks may be problematic, and is concerned as to how this test is going to be conducted. Commenter 16 asserts that, in order to apply pressure to the interstitial space the contents of the tank will need to be removed and if this is done, the residual vapors in the tank must be evacuated to mitigate the explosion hazard. Commenter 16 says that applying a vacuum to the secondary containment may be an effective test, even with product in the tank. However, Commenter 16 is unaware of any particular testing company that is third-party certified to conduct a 0.1 gph vacuum test at the 95/5 probability standard. S16 - 01

Response:

S16 – 01: We agree that post-installation testing of secondary containment systems will present unique problems that did not exist during the test at installation. We will be proposing changes to the proposed regulations that allow flexibility in handling this situation on a case by case basis, while still maintaining the same test criteria used at installation.

Result: Subdivision 2637(a)(2) will be revised to allow differing methods of testing than those at installation, while still maintaining the same test criteria.

Under-Dispenser Containment

Comment: Commenter 16 says the underground storage tank systems that supply emergency generators don't have dispensers therefore they don't need under-dispenser containment. S16 - 02

Response:

S16 – 02: See the response for a similar comment submitted by "Commenter 9".

Result: No changes.

COMMENTER 17

Secondary Containment Testing

Comment: Commenter 17 says that periodic testing of secondary containment systems for underground storage tanks already installed will likely entail a considerable cost for owners or operators, and not result in significant additional environmental protection. Commenter 17 states that the additional costs, aside from the test itself, will be incurred by the owner/operator having to make extensive modifications to the tank system in order to accommodate future secondary containment testing.

This is because, Commenter 17 asserts, double-walled tanks constructed in accordance with the Steel Tank Institute (STI) dual wall standard were shipped with the interstitial monitoring port flush with the top of the tank. This allowed owners/operators/installers to place various forms of release detection equipment into the interstice. Commenter 17 claims that, depending on the final design of the system at installation, 25% to 50% of currently installed double-walled tanks will require some additional work in order to perform the secondary containment test according to some STI members.

Commenter 17 says that these modifications may include removal of sumps, or where sumps have not been installed, cutting through concrete to get to the top of the tank to access the interstice. Furthermore, Commenter 17 points out, for those systems where the contractor extended the monitoring pipe to grade, such extensions were made liquid tight, but may not be pressure or vacuum testable without modifications. Commenter 17 says that the modifications described above will certainly generate some expense in order to comply with the new requirement. LS17-01

Regarding the issue of environmental protection, Commenter 17 claims that the performance of STI labeled double-walled tanks renders the new requirement for periodic secondary containment testing unnecessary. Commenter 17 claims that over 60,000 STI labeled double-walled have been installed and there have been no reported incidents of a release from the primary tank into ground water.

Regarding the exemption from secondary containment testing in 2637(a) for systems that automatically and continuously test the secondary containment systems by virtue of their inherent design, Comment 17 claims that these monitoring methods rely on the owner/operator to visually inspect the equipment on a regular basis. Commenter 17 also asserts that there is no requirement for an alarm or any other device to detect leaks on a continuous basis in this section. LS17-02

Response:

LS17 – 01: We agree that for many secondary containment systems, modifications will need to be made to the system to conduct an adequate test, and these modifications will generate some expense. However, the benefits of testing outweigh costs by ensuring that leaks through secondary containment systems do not continue indefinitely. Regarding the claims made by Commenter 17 relating to the integrity of STI labeled double-walled tanks, this is not a comment on the regulations.

LS17 – 02: The exemption from periodic secondary containment testing was given for UST's that are monitored by methods that automatically monitor both the primary and secondary containment systems. These monitoring methods typically assess the status of interstitial fluids such as brine or air, or they monitor the status of a vacuum. Since, under these conditions, a breech in either the primary or secondary containment will be detected, there is no need for an additional test of the secondary containment system. Whether or not the monitoring method requires active participation by the owner or operator is moot provided that the monitoring system, including the necessary visual checks and the method of alarm, meets state requirements and has been approved by the local agency.

Result: No changes.

COMMENTER 18

<u>Secondary Containment Testing</u>

Comment: Commenter 18 asserts that the requirements for secondary containment testing are too stringent for two key reasons: 1) any leak from the primary containment would be contained by the secondary containment and detected by current leak detection methods; and 2) the probability of both the primary and secondary containers failing simultaneously is extremely low. Given the above, Commenter 18 suggests that the SWRCB re-consider the triennial testing frequency in favor of a longer frequency. L18 - 01

Commenter 18 suggests that the determination of the testing frequency should ideally be based on actual or predicted data on the occurrence of failures in both containment systems. However, in lieu of this information Commenter 18 recommends a frequency of 10 years, and suggests requiring additional monitoring such as SIR as further verification that releases are not occurring into the secondary containment system with this reduced testing frequency.

Response:

L18 – 01: A 36-month cycle for testing the secondary containment system was chosen as a cost-effective compromise to the annual time-interval recommended by the majority of respondents to a secondary containment testing survey conducted by the SWRCB. However, a ten-year interval is simply too long, and inconsistent with the periodic testing and maintenance requirements of nearly every other component of underground storage tank systems.

While the probability of the both the primary and secondary containment systems failing simultaneously is very low, the probability of the secondary containment system failing first and subsequent failure of the primary system is much higher. Additionally, if this occurs the primary system may never detect the leak because the fuel is exiting the secondary containment system before it reaches the probe. Finally, a triennial testing interval will provide valuable and timely data regarding the overall integrity of secondary containment system and the testing interval be adjusted accordingly be a change in the regulations.

Result: No changes.

Under-Dispenser Containment

Comment: Commenter 18 says that since the requirement for under-dispenser containment will necessitate retrofitting existing facilities, the SWRCB should allow flexibility when approving under-dispenser containment system. Commenter 18 note that there is technology available that uses liquid polymers that solidify into an effective product-tight containment. This flexibility, Commenter 18 asserts, will allow avoid the need to rebuild islands and hence avoid the closing of facilities that cannot handle the extra cost involved. L18 - 02

Response:

L18 – 02: The requested flexibility regarding alternative designs for under-dispenser containment systems is already incorporated into subdivision 2636(h)(3) and 2636.1 through 4.

Result: No changes.

Enhanced Leak Detection

Comment: Commenter 18 says that the SWRCB should reconsider using tracers to meet the enhanced leak detection requirement. Commenter 18 is unaware of any reliable tracer methods for use with underground storage tank systems. Additionally, Commenter 18 claims that this technology leads to many false positives (i.e. detections) and the method is relatively difficult of perform correctly. Furthermore, Commenter 18 is concerned about the method's reliability in either clay or saturated soils. Finally, Commenter 18 asserts that this method is designed to detect product in soil rather than losses (from the tank). Commenter 18 prefers methods that L18 - 03 detect releases, so that there is opportunity to correct potential leakage problems before product can be detected in soils.

Response:

L18 – 03: The provisions set forth in subdivision 2644.1(a)(2) ensure the reliability of the proposed method for enhanced leak detection by requiring that the method be third party certified and be capable of detecting the proposed leak rate with a 95% probability of detection and a 5% probability of a false alarm. The 95/5 leak detection reliability standard is adopted from the federal standard pursuant to 40 CFR 280.40(a)(3). Regarding the variability of soil conditions, for external leak detection methods (such as the tracer method), the third party certification protocol requires that the method meet the 95/5 reliability standard in at least five different types of soil conditions.

With respect to the comment that the tracer type leak detection method is designed to detect product in soil and not releases from the tank system, this comment lacks merit. Any detection of the tracer substance, which is chosen for its uniqueness in the environment, in the soil or backfill outside the tank and piping system indicates a release from these systems and not simply a detection of the substance in the soil. Furthermore, because several probes are used to detect tracer releases, the general location of the leak can be gleaned from the distribution and concentration of the tracer substance detected in the probes. Internal methods, which only detect releases from the tank and piping system, cannot indicate the location of the leak with any reasonable degree of accuracy.

Result: None.

Tank Installer Training

Comment: Although Commenter 18 believes that a requirement to ensure that installers are qualified to properly install underground storage tanks is appropriate, Commenter 18 believes the proposed requirement for triennial re-certification is unnecessary (except possibly for inexperienced installers). Commenter 18 suggests that experienced installers should only be required to demonstrate that they have been actively installing tanks over the previous three years. Commenter 18 says this would minimize the burden to installers while still meeting the intent of the law. L18 - 04

Additionally, Commenter 18 notes that the requirement is for each individual manufacturer to provide training. Because there are many manufacturers of underground storage tank systems, Commenter 18 says that the proposed rule would benefit by streamlining the requirement to a single provider of this training for all or most UST systems, with the specifics of individual systems highlighted. Commenter 18 says that this would eliminate the need for installers to be certified by multiple manufacturers. L18 - 05

Response:

L18 – 04: Regarding the need for tank installer re-certification, see the response to a similar comment from Commenter 10.

L18 – 05: Regarding the proposal to require that a single provider for tank installer training, we disagree with this comment. The manufacturer of the equipment being installed is the best source of training for that equipment, especially with respect to recent updates of the design and construction of that equipment, or improved installation techniques. It would be very difficult for a single provider to keep up with all of the changes occurring with a multiple manufacturers.

Result: No changes.

COMMENTER 19

Enhanced Leak Detection

Comment: Commenter 19 says that, because the proposed requirements for enhanced leak detection mandate an external method using a chemical marker, the SWRCB has an opportunity to take better advantage of the sensitivity capability of this method by requiring an even lower maximum leak rate. Commenter 19 says that the lowest sensitivity for this leak detection method recognized by a third party evaluated is 0.005 gallons per hour, with a probability of detection of 97% and probability of false alarm of 3%. Commenter 19 points out that this amounts to a leak of only 44 gallons per year versus 440 gallons per year with the 0.05 limit set forth in the proposed regulations. L19 - 01

Commenter 19 says that lowering the sensitivity requirement for enhanced leak detection will not exclude any methods or technologies that the proposed standard would include. Furthermore, Commenter 19 claims that a more stringent sensitivity requirement may spark innovation in a variety of competing technologies with the potential of bringing leak detection to a new level across the board.

Response:

L19 – 01: We agree with this comment.

Result: Subdivision 2644.1(a)(2) will be changed to increase the required enhanced leak detection sensitivity from 0.05 gph to 0.005 gph.

COMMENTER 20

Enhanced Leak Detection

Comment: Commenter 20 says that at the staff level hearing held last October 27 for enhanced leak detection, it presented proposed alternatives to the "sole source" method included in the proposed regulations. Commenter 20 states that it has received a number of inquiries from its

L20 - 01

customers regarding whether or not its proposed alternative methods will be acceptable for enhanced leak detection. Commenter 20 urges the SWRCB to re-consider giving owners and operators of underground storage tanks the option to us any combination of the following methods as a substitute to the external method mandated in the proposed regulations:

1. Third-party monitoring
2. More frequent precision testing of lines at 0.2 gallons per hour bimonthly or weekly
3. More frequent Continuous Statistical Leak Detection i.e. either daily, weekly, etc.

Commenter 20 asserts that there are simply not enough options included in the proposed regulations to test or monitor the secondary containment to meet enhanced monitoring/testing requirement. Commenter 20 urges the SWRCB not to "sole source" enhanced leak detection, and recommends that the SWRCB set a general standard and let industry propose alternatives that meet or exceed the standard.

Response:

L20 – 01: The enhanced leak detection standard set forth in subdivision 2644.1(a)(1) and (2) was selected because, in addition to the high sensitivity available by this method, it is also capable of determining the location of a leak. Internal methods such as those proposed by the Commenter, do not have this capability regardless of their sensitivity capability. This is very important to the tank owner/operator since finding a leak may be very costly if there is no evidence pointing to its approximate location within the system.

With respect to the "sole source" issue, the SWRCB recognizes that the enhanced leak detection standards set forth in subdivision 2644.1(a)(2) are stringent and may currently be achievable through the use of only one technology, however the regulation does not mandate the use of any particular technology. (See *Rybachek v. U.S. Environmental Protection Agency*, (9th cir. 1990) 904 F.2d 1276, 1298 (finding that the United States Environmental Protection Agency's setting of zero-discharge limitations on wastewater used in placer mining did not mandate the use of any particular technology, even though the standards were stringent and might be achievable only through the use of certain technology).)

Result: No changes.

COMMENTER 21

<u>Secondary Containment Testing</u>

Comment: Commenter 21 says that it seems likely that the SWRCB would prefer replacement of secondary containment systems that cannot be tested, such as lined trench systems, than to have ongoing alternative testing for these systems. Commenter 21 suggests that where an LS21-01 owner/operator commits to replacement of the non-testable secondary containment system by a certain date or year in advance of the July 2005, they should be exempt from the testing requirement.

Additionally, Commenter 21 recommends that where a system cannot be tested but the owner/operator agrees to take the route of enhanced leak detection, the requirements should state that only one test is required since. This is because, Commenter 21 notes, there would be no benefit to conducting a second test for a system that will be removed by July 2000. LS21-02

Commenter 21 also says that, in subdivision 2637(a)(2), the current proposed language authorizes a local agency to proceed to specify a test method even though manufacturer's guidelines, industry codes or engineering standards already exist. Commenter 21 recommends that this language be revised to clearly state that the local agency can only specify the method if manufacturers guidelines, industry codes, or engineering standards do not exist. LS21-03

Response:

LS21 – 01, LS21 – 02, LS21 – 03: See the response to the similar comments submitted by Commenter 7.

Result: See Commenter 7.

Under-dispenser Containment

Comment: Commenter 21 says that, according to existing state policies (May 17, 1995 LG letter) dispensers installed after August 1, 1995 are required to have under-dispenser containment. Commenter 21 further states that the January 2000 date included in the proposed regulations seems at odds with current requirements and would be retroactive from the perspective of the proposed rulemaking. LS21-04

Additionally, Commenter 21 asserts that because existing subdivision 2636(f)(3) allows some flexibility for the monitoring of piping, it would be appropriate to grant similar flexibility to under-dispenser containment. As such, Commenter 21 proposes that under-dispenser monitoring systems that shut down the dispenser in the event of a leak, be allowed in lieu of monitoring by an audible and visual alarm. LS21-05

Commenter 21 further claims that the proposed requirement (in subdivision 2636(h)(3)) for approval by the SWRCB of under-dispenser spill control or containment systems apparently does not make allowance for third-party approval for acceptability of these systems. Commenter 21 suggests that the language be revised to specifically reference the acceptability of third-party approvals. LS21-06

Finally, referring the subdivisions 2666(a), (b), and (c), Commenter 21 notes that since the dates identified in these subdivisions (December 22, 1998) are behind us, the wording of these regulations should be expressed differently. LS21-07

Response:

LS21 – 04: The requirement for installation of under-dispenser containment for systems installed after January 1, 2000 is specified by newly enacted Health and Safety Code section 25284.1. However, under-dispenser containment has been required for all systems installed after July 1, 1987 per Health and Safety Code subsection 25291(a)(7)(E), the new statutes simply clarify previous law. There essentially has been no change regarding the under-dispenser requirements for systems installed after this date.

LS21 – 05: Same comment as S2 – 02.

LS21 – 06: Regarding the acceptability of under-dispenser containment, we believe the proposed regulations are clear regarding the two types of under-dispenser containment that may be installed: 1) third-party (and local agency) approved under-dispenser containment installed in accordance with proposed subsection 2636(h)(2); and 2) SWRCB approved Spill Containment and Control Systems installed in accordance with proposed subsection 2636(h)(3). There is no need for further clarification.

LS21 – 07: Not a comment on the proposed regulations.

Result: No changes.

<u>**Enhanced Leak Detection**</u>

Comment: Commenter 21 recommends that "siphon piping" be included in the list of components not considered single-walled components in subdivision 2640(e)(1). This is because, Commenter 21 notes, "siphon piping" operates at a negative pressure much like suction piping, and connects two underground storage tanks across the top of the tanks. Commenter 21 says that if a leak were ever to develop, the siphon would be broken and the liquid in the siphon lines would merely drain back in to each of the two tanks. LS21-08

Regarding the required method for enhanced leak detection, Commenter 21 strongly believes that it is inappropriate for the State to impose any sort of requirement that can only be conducted by a single contractor. Commenter 21 says that there is a demonstrable need for other choices because there are certain site-specific conditions where the prescribed method will not work. Other methods, Commenter 21 notes, do exist or may become available that may offer comparable assurances regarding the integrity of UST systems. LS21-09

Additionally, Commenter 21 says that the SWRCB is about the embark on an extensive, statewide, field-based research program being conducted by the only known company that can conduct the prescribed enhanced leak detection method. Commenter 21 states that the experience gained in doing this research should be able to determine if this method is actually as effective and reliable as claimed, and the SWRCB should delay mandating this method until these results are in. LS21-10

Commenter 21 also asserts that the statement of reasons identifies a triennial frequency but this has not been included in the proposed regulations. Commenter 21 believes that a triennial frequency is not unreasonable and that it should be made clear in the proposed regulations. LS21-11

Finally, Commenter 21 says that a provision should be incorporated into the proposed regulations that would allow for a facility owner/operator to elect to replace single-walled components prior to the date for which enhanced leak detection is required in order to obviate the need for enhanced leak detection. LS21-16

Response:

LS21 – 08: With respect to "siphon piping", this piping is considered suction piping which is already exempt from being considered as a single-walled component under the proposed regulations. Regarding the issue of their only being a single-provider for enhanced leak detection, see the response to similar comments made by Commenters 18 and 20.

LS21 – 09: With respect to the "sole source" issue, the SWRCB recognizes that the enhanced leak detection standards set forth in subdivision 2644.1(a)(2) are stringent and may currently be achievable through the use of only one technology, however the regulation does not mandate the use of any particular technology. (See *Rybachek v. U.S. Environmental Protection Agency*, (9th cir. 1990) 904 F.2d 1276, 1298 (finding that the United States Environmental Protection Agency's setting of zero-discharge limitations on wastewater used in placer mining did not mandate the use of any particular technology, even though the standards were stringent and might be achievable only through the use of certain technology).)

LS21 – 10: We do not believe there is any valid reason for delaying the implementation of the proposed enhanced leak detection requirements. We chose the investigative method being used for the field-based research based on our knowledge of the historical reliability and accuracy of that method at underground storage tank sites around the country. We are therefore already confident in its effectiveness (see the response to the enhanced leak detection comments submitted by Commenter 18) for field-based research and for enhanced leak detection.

LS21 – 11: We agree with this comment.

LS21 – 16: There is no need for a specific provision to allow for a facility owner/operator to elect to replace single-walled components prior to the date for which enhanced leak detection is required in order to obviate the need for enhanced leak detection. This can already be accomplished through the petition process set forth in 2640(e)(2) and (3) by stating that the facility does not (or will not by the deadline), have a single-walled component and submitting supporting evidence. However, if an owner/operator elects to replace the single-walled component with a double-walled component, and the SWRCB certainly encourages this, soil samples will need to be taken from underneath and around the former single-walled component and analyzed prior to installation of the new component.

Replacing a single-walled component with a double-walled component to obviate the need for enhanced leak detection is consistent with the intent of the law. The purpose of enhanced leak detection is to provide added protection for public drinking water wells against releases from underground storage tank systems that are most likely to leak into the environment i.e. single walled tank systems. This is accomplished in two ways:

1) Using a highly sensitive and accurate leak detection method that performs better than routine monitoring methods, i.e. enhanced leak detection. This procedure will determine if a single-walled component is leaking at a very low leak rate and thus provides an extra preventive measure of protection for nearby public drinking water wells above routine monitoring; and,
2) Replacing the single-walled component with a double walled component to obviate the need for enhanced leak detection. This procedure provides even more protection than option 1 by first removing the high-risk component and then by mitigation, via the soil sampling and remediation process, of any prior leaks that may have occurred undetected.

Result: Section 2644.1 will be revised to require enhanced leak detection every 36 months.

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 21 says that the proposed requirement in subdivision 2637(b)(4) that owners/operators notify the local agency 48 hours in advance of conducting the work may actually delay repairs that are needed immediately. Therefore, Commenter 21 recommends that the language be revised to only require announcements for repairs that have already been scheduled. LS21-13

Commenter 21 also says that the requirement for putting a tag or sticker on equipment that has been inspected (subdivision 2637(b)(1)(5) does little to ensure that the inspection and certification was proper. Furthermore, this is a cumbersome process for annual monitoring maintenance inspectors, introduces additional potential compliance problems, says Commenter 21, and should be replaced with a simpler tracking requirement. LS21-14

Finally, referring to subdivision 2637(b)(1)(C), Commenter 21 states that manufacturers may conduct refresher training more frequently than triennially. Therefore Commenter 21 recommends that the language be revised to require that the refresher certification occur <u>at least</u> every 36 months. LS21-15

Response:

LS21 – 13: Regarding the 48-hour prior notice requirement, local agencies may waive this requirement for emergency repairs. Providing a specific regulatory exemption for "scheduled repairs" would be ambiguous since owners or operators may classify almost any repair as unscheduled. Additionally, it is in the best interest of local agencies and UST owners and operators to have emergency repairs completed as soon as possible.

LS21 – 14: Regarding the placement of tags or stickers on equipment that has been inspected, this requirement was included in response to the inspection experience of several local agencies, and SWRCB staff. This experience indicated that the monitoring equipment at many facilities is not inspected at all, even though technician conducting the certification claims that it has been inspected. We believe the tag/sticker method if tracking is reasonable and will at least show that the monitoring equipment was touched during the inspection.

LS21 – 15: We agree that refresher training for annual monitoring maintenance inspectors should be conducted at the frequency recommended by the manufacturer or at least every 36 months.
Result: Subdivision 2637(b)(1)(C) will be revised to require annual monitoring maintenance inspectors to be re-certified at the frequency recommended by the manufacturer or at least every 36 months.

Tank Installer Training

Comment: Referring to subdivision 2635(d)(1) Commenter 21 claims that tanks and piping may be made by different manufacturers, and these manufacturers may conduct more frequent refresher training than triennially. Therefore Commenter 21 recommends that the language be revised to require that the refresher certification occur at least every 36 months. LS21-12

Response:

Ls21 – 12: We agree with this comment.

Result: Subdivision 2635(d) will be revised to incorporate this recommendation.

COMMENTER 22

General Comments

Commenter 22 presented oral comments at the public hearing, and resubmitted written comments to the proposed regulations that had been given to the SWRCB prior to publication of the Notice of Proposed Rulemaking. The written comments were originally submitted in response to a pre-NPRM draft regulatory package the SWRCB gave to select parties to review prior to formal publication. These include comments about proposed regulations regarding inspection of cathodic protection systems and UST equipment compatibility and permeability relating to changing fuel formulations. LS22-01

Commenter 22 also mentioned the absence of certain regulations in the draft package that were mandated by Senate Bill 989. These included regulations regarding under-dispenser containment, training for local agencies and UST owner/operators, and local agency periodic UST facility inspections. Finally, Commenter 22 also remarked about the requirement in SB 989 that the SWRCB conduct a field based research program that would "seek to identify the source and causes of releases and any deficiencies in leak detection systems."

Commenter 22 also expressed general concerns that local agencies are not doing an adequate job. LS22-07

Response

Ls22 – 01: Since the proposed regulations that were finally included in the NPRM were revised from the pre-NPRM draft, Commenter 22's comments regarding cathodic protection systems, and UST equipment compatibility and permeability are irrelevant since they relate to proposed regulations, and amended section numbers, that were not contained in the final NPRM that was published on May 12, 2000. Commenter 22's comments regarding the absence of proposed regulations with respect to under-dispenser containment and local agency local agency periodic UST facility inspections are also irrelevant since the under-dispenser regulations were eventually included in the May 12 NPRM, and the local agency UST inspection requirements were postponed to a subsequent rulemaking. Regarding field-based research, no regulations on this matter were required by SB 989.

LS22 – 07: Not comments on the proposed regulations.

Result: No changes.

<u>**Secondary Containment Testing**</u>

Comment: Commenter 22 says that there should be leeway granted for the development, issuance and transfer to UST agencies of an electronic version of the "monitoring system certification form." LS22-02

Response:

LS22 – 02: The proposed regulations do not exclude the development, issuance, and transfer to UST agencies of an electronic version of the "monitoring system certification form."

Result: No changes.

<u>**Enhanced Leak Detection**</u>

Comment: Commenter 22 says the SWRCB's reasoning in establishing the 0.05 leak detection rate for enhanced leak detection may be flawed. This is because, Commenter 22 notes, the SWRCB based the leak detection rate on information indicating that underground storage tanks may be leaking (undetected) below the current maximum leak rate sensitivity (0.1). However, Commenter 22 points to studies that indicate that many UST leaks that are discovered when the tank system is removed, are the result of disconnected/disabled leak detection devices. Commenter 22 says that the SWRCB may be invoking more onerous measures due to a theory not based on facts. LS22-03

Commenter 22 also expressed significant concern the proposed requirement for enhanced leak detection can only be met by one method, and perhaps one vendor. Commenter 22 asserts that the SWRCB should give additional consideration to the benefits of tighter internal detection methods, such as more periodic automatic tank gauge testing, as an alternative method for enhanced leak detection. Commenter 22 states that even though increased false-alarms may occur for these UST sites in sensitive areas, further investigation should be mandated. LS22-04

Finally, Commenter 22 says that the SWRCB did not require that enhanced leak detection be conducted periodically, and additional periodic enhanced leak detection should be required, no less than every 3 years between events. LS22-05

Response:

LS22 – 03: First, the proposed enhanced leak detection maximum detectable leak rate of 0.05 gph is not onerous, and in fact, over a 1 year period, 440 gallons would leak into the environment undetected at 0.05 gph. Given that, under the California Water Code, there is no allowable discharge of fuel into the environment, the 0.05 gph proposed leak rate is quite lenient. However, leak detection sensitivity standards, both for routine monitoring under Article 4, and the proposed enhanced leak detection, are chosen in consideration of best available technology and cost versus the benefits to be obtained from the sensitivity standards.

The proposed method for enhanced leak detection was chosen because, among other reasons, it was capable of being third-party certified to a leak rate sensitivity of 0.05 gph, and recently has been third-party certified to a leak rate sensitivity of 0.005 gph. As such, this method is the current best available technology. However, this method is also too costly for routine monthly monitoring and thus is only being required for triennial enhanced leak detection.

Second, while acknowledging that releases have occurred from new and upgraded UST systems, the study prepared by the Advisory Panel on the Leak History of New and Upgraded UST systems also noted that the data was skewed toward facilities with known releases, older systems, and/or systems with non-upgraded components. As such, there is still merit in seeking data regarding the potential for undetected low-level leaks from single-walled systems, data that will be obtained by using a leak rate sensitivity that is lower than that required for current routine monitoring.

LS22 – 04: Same comment as L20 – 01 and L21 – 09.

LS22 – 05: Same comment as L21 – 11.

Result: Subdivision 2644.1(a)(3) will be revised to require enhanced leak detection every 36 months.

Tank Installer Training

Comment: Commenter 22 says that the proposed additional requirements for tank installer training should cover all activities related to repairs and upgrades under Article 6. LS22-06

Response:

LS22 – 06: With respect to repairs of UST systems, this activity is covered by proposed section 2637(b), which requires those who repair UST systems to have a contractors license and be re-certified by the manufacturer at least every 36 months. These requirements are similar to the proposed additional requirements for tank installers. Regarding UST upgrades, qualification requirements are already specified in Article 6 for the various types of upgrades, including tank lining and installation of bladders.

Result: No changes.

B. SUMMARY OF, AND RESPONSE TO, COMMENTS (NOV. 22 TO DEC. 11)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
(Comments submitted between May 12 and July 18, 2000)

Comments to the proposed regulations to implement SB 989 were submitted both in writing and by oral testimony. The oral testimony was given at a public hearing conducted on July 18, 2000 in Alhambra, and documented in the transcript of proceedings (Transcript) for the hearing prepared by the court reporter. All of the written comments and oral testimony, relevant or not, are summarized below.

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments. If a commenter presented oral testimony at the public hearing the page number(s) where their respective comments can be found in the Transcript is given next to their name. Commenters with two dates identified presented written and oral testimony.

	NAME	DATE
1	Afforda Test (20 – 23):	July 18, 2000
2	Bravo Systems (12 – 14):	July 18, 2000
3	California CUPA Forum (47 – 52)	July 17, 18, 2000
4	CIOMA	July 18, 2000
5	Equiva Services LLC, SH&E Compliance	June 12, 2000
6	Environmental Working Group	July 18, 2000
7	Exxon Mobil	July 10, 2000
8	Harmon, Brian	June 9, 2000
9	L.A. County Dept. of Public Works (42 – 46)	July 18, 2000
10	Mosier Brothers Storage Tanks (15 – 16)	July 18, 2000
11	Orange County Health Care Agency	July 18, 2000
12	Pasadena Fire Department (39 - 41)	July 18, 2000
13	Pearson Equipment & Maintenance Company	July 17, 2000
14	Rock, Dennis (16 – 18)	July 18, 2000
15	Southern California Edison (36 – 38)	July 18, 2000
16	SPC (Parent to Pacific Bell et al) (55 – 56)	July 18, 2000
17	Steel Tank Institute (28 – 31)	July 11, 18, 2000
18	Time Oil Company	July 10, 2000
19	Tracer Research Corporation	July 3, 2000
20	Veeder-Root Company	July 18, 2000
21	Western State Petroleum Association (33 – 35)	July 12, 18, 2000
22	White Environmental Associates (52 – 54)	July 18, 2000

Each commenter's remarks are summarized below under the related subject matter, followed by the SWRCB response.

COMMENTER 1

Annual Maintenance Certification

Comment: Commenter 1 said that the new requirement for licensing of annual monitoring certification technicians (Monitoring Technicians) was confusing in that there was no apparent reason for it. Additionally, Commenter 1 stated that the licenses listed in the law and regulations are unrelated to the type of work conducted by service station annual maintenance technicians. Commenter 1 suggests that the SWRCB should request the Contractors State Licensing Board (CSLB) to provide a new license that is specific to annual monitoring maintenance work. Finally, Commenter 1 requests clarification as to whether the licensing requirements apply to the technician conducting the work or the contractor.

Response: The licensing requirements for annual monitoring maintenance inspectors, and the list of acceptable contractors licenses for this work, were recommended to the legislature by the California Leak Monitoring (CALM) committee. This committee was formed by the SWRCB in response to complaints by local agencies regarding the quality of work performed by many annual monitoring maintenance inspectors.

Specifically, local agencies asserted that, because there are currently no required training standards and licensing requirements for annual monitoring maintenance inspectors, virtually anyone may do the work, and continue to do the work, despite poor performance and deceptive work practices. The CALM committee studied this issue and concluded that required training standards and licensing would improve the quality of work from annual monitoring maintenance inspectors and also hold them accountable under threat of license revocation.

Furthermore, the findings of another SWRCB panel that was assembled in response to a request by Governor Pete Wilson to identify the appropriate measures to mitigate leaks of MTBE from underground storage tanks, study the sources appointed by gov willson,

Firstly, the proposed regulations regarding licensing for Monitoring Technicians implement Health and Safety Code (HSC) section 25284(.1(a)(1)(D), which identifies five CSLB licenses each of which may be used to satisfy the new requirement. A recommendation to require this licensing was included in a report prepared by the California Leak Monitoring (CALM) committee for the California legislature.

In studying the issue of annual monitoring equipment maintenance certification, the CALM committee found that........

Comments rejected....

COMMENTER 2:

Secondary Containment Testing

Comment: Commenter 2 requests that the SWRCB clarify the type of periodic secondary containment testing that is acceptable to state and local agencies. Specifically, whether or not the test must be in accordance with the original manufacturers test or the test used at installation. Commenter 2 asserts that, for sumps, the manufacturer's original test is a visual test. However, this commenter says that when it has approached local agencies regarding whether or not they would accept a visual test for periodic secondary containment, the local agencies have rejected the idea. Furthermore, Commenter 2 says that the test at installation is usually a hydrostatic test, with the containment area being filled above the highest penetration fitting, and this may involve over 300 gallons of water. Commenter 2 claims that if the hydrostatic test is used for periodic secondary containment testing, the water used for the test would become contaminated by residual fuel in the sumps and may impact soil beneath the sumps.

Response: The SWRCB agrees with this commenter that the current language in the proposed regulations is vague as to what type of periodic secondary containment test is acceptable. As such, this language will be revised accordingly.

...go ahead and change regs to specifiy the periodic test must be same as test at installation..........................

Under Dispenser Containment

Comment: Commenter 2 requests clarification regarding the type of leak detection equipment required in the proposed regulations for under dispenser containment (UDC). This commenter states that it has been manufacturing, and using as UDC leak detection, a float-trip mechanism which stops the flow of product when a dispenser leak occurs. Furthermore, the commenter asserts that this method of UDC monitoring has been accepted throughout California for several years as a type of audible/visual alarm in that a customer complaining about not getting fuel satisfies the audible/visual requirement. Commenter 2 also claims that the float-trip mechanism is superior to electronic audible/visual alarms because it does not rely on electricity for proper operation, and it stops the flow of product when a leak occurs. Essentially, Commenter 2 wants to know if the float-trip type of UDC monitoring will continue to be acceptable in California.

Response: Yes it will...

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 2 also requests clarification as to whether or not the new requirements for annual monitoring maintenance inspectors applies to the manufacturer of UDC equipment, including UDC monitoring equipment.

Response:

COMMENTER 3:

Secondary Containment Testing

Comment: Commenter 3, expressed support for the proposed secondary containment testing requirements saying that such testing is incredibly important. This is because, Commenter 3 asserts, even if the best monitoring system in the world is used to monitor secondary containment, it will be useless if there is a hole in the secondary containment that allows fuel to leak into the environment prior to reaching the probe. Additionally, Commenter 3 (representing a local agency), affirms that a visual secondary containment test (inspection) will be adequate for periodic secondary containment provided that the secondary containment system is removed from the ground for inspection.

Response: Comments in support of the proposed requirements do not warrant a response. Regarding a visual secondary containment inspection, we agree with Commenter 3 ...

Enhanced Leak Detection

Comment: Commenter 3 acknowledges the need for enhanced leak detection because of the importance of drinking water aquifers and the fact that, in some areas, ground water is the sole source, or almost the sole source, of drinking water supply. In light of this, Commenter 3 asserts that the frequency of enhanced leak detection should be the same as the frequency for tank integrity testing for single-walled underground tanks.

Commenter 3 supports this assertion by noting that the only existing, third-party approved, method of enhanced leak detection (the method that meets all SWRCB requirements) is also approved for annual tank testing. Additionally, Commenter 3 points out that enhanced leak detection is only required for tank systems with the least amount of protection (single-walled systems) located in the most environmentally sensitive areas (near public wells). Given the above, Commenter 3 argues that enhanced leak detection should be done on an annual, instead of triennial, basis.

Response: Get real Jim!

Under Dispenser Containment

Comment: Commenter 3 supports a requirement that monitoring of UDC be done using an audible and visual alarm system, rather than simply by a float-trip mechanism. Commenter 3 states that float-trip mechanisms are prone to failure due to improper maintenance, or collection of debris in the UDC, which may prevent the float from actuating in response to a leak. This is indicated, Commenter 3 claims, by the fact that 40 percent of the float-trip mechanisms in its jurisdiction are not functioning properly.

Additionally, Commenter 3 notes that fuel that collects in UDC will likely be a fire hazard and thus pose a hazard to customers pumping gas nearby, especially in the case of a three compartment UDC box. In this case, Commenter three asserts, one compartment may contain fuel that has leaked until the pump was shut-off, but the other two pumps may still be functioning (and continued to be used by customers) because fuel did not over flow into those compartments and shut-off the other pumps.

Given the above scenarios, Commenter 3 says that an audible and visual alarm, coupled with automatic shut-off, will be more effective, and safer, than float-trip mechanisms. This is because, Commenter 3 alleges, a loud audible alarm, combined with the fuel shut-off, will demand immediate attention by the fuel station operator, thus minimizing the fire hazard of collected fuel in the UDC.

Response: Get real Jim!

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 3 supports the proposed regulations regarding Annual Monitoring Maintenance Inspector Requirements. Commenter 3 says that currently many of these inspectors do not have any training and that any one of us can legally do the annual inspections, as such, these inspections may be conducted improperly. Furthermore, Commenter 3 says that these inspections are important to verify that monitoring equipment is properly operating.

Response: These comments are in support of the proposed regulations and thus do not warrant and response.

Tank Installer Training

Comment: Commenter 3 states that it is not uncommon for mistakes to be made during the installation of underground storage tank, and that these mistakes are made by business that have installing underground tanks for years. Because of this, Commenter 3 asserts that the additional tank installer training is necessary.

Response: These comments are in support of the proposed regulations and thus do not warrant and response.

Other Comments:

Comment: Commenter 3 also made comments regarding the underground storage tank facility inspection requirements incorporated into Senate Bill 989 (supporting legislation for the proposed regulations).

Response: The facility inspection requirements are not included in the proposed regulations and thus these comments are irrelevant and do not warrant a response.

COMMENTER 4:

General Comments

Commenter 4 says that timing of the proposed regulations poses an unnecessary and costly burden to small business tank owners given that they just recently had to comply with the December 22, 1998 underground storage tank upgrade requirements. Commenter 4 claims that the state should have discovered the need for the new regulations earlier so that they could have been incorporated in the 10 year upgrade period, thereby making it easier for tank owners to comply all at once, rather than in frequent, and unexpected, iterations. This is especially the case, Commenter 4 asserts, with respect to the proposed requirements for secondary containment testing and installation of under-dispenser containment. Commenter 4 says that the cost of complying with these requirements will be much higher than they would have been had tank owners know of the requirements during the 10 year upgrade period. Additionally, Commenter 4 says tank owners will once again have to shut-down operations to comply with the new requirements.

Response

Annual Monitoring Maintenance Inspector Requirements

Commenter 4 is also concerned about the proposed training and licensing requirements for annual monitoring maintenance inspectors. In addition to the increased costs for the annual inspections, Commenter 4 states that the proposed requirements will give manufacturers the ability to limit the number of contractors able to conduct the work. Commenter 4 says that this may further increase costs when the supply licensed and certified annual monitoring maintenance inspectors fail to meet demand.

Response:

Commenter 5

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 5 says that Section 2637(b)(1)(A) is not clear as to whether all of the licenses, or just one of the licenses, is required to meet the licensing requirements for annual monitoring maintenance inspectors. Commenter 5 recommends adding "or" between each license listed for clarification.

Response:

<u>Under Dispenser Containment</u>

Commenter 5 recommends changing "Spill Containment or Control System" to "<u>Dispenser</u> Spill Containment or Control System", in sections 2611, 2636.1, 2636.2, and 2636.4.

Response:

<u>Tank Installer Training</u>

Comment: Commenter 5 recommends amending Section 2635(d)(1) to read as follows:

> The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers~~;~~. **<u>This certification must be renewed every 36 months ~~upon~~ by completion of refresher training provided by the manufacturer</u>.**

Commenter 5 also says that the effective date for the initial refresher training for currently certified installers needs to be clarified.

Response:

COMMENTER 6

General Comments: Commenter 6 submitted a report entitled "*Uncontrolled Lusts: How California Fails to Protect Our Water From Leaking Underground Storage Tanks*" as comments to the proposed regulations. This report documents a study conducted by Commenter 6 on the historical performance of the SWRCB and the Regional Water Quality Control Boards with respect to enforcing the cleanup of leaking underground storage tanks.

Response: The SWRCB could not find any specific comments relating to the proposed regulations in the subject report. Therefore, no response is necessary.

COMMENTER 7

<u>Secondary Containment Testing</u>

Comment: Commenter 6 says that the alternative to secondary containment testing (for systems not testable), identified in proposed subdivision 2637(a)(1) is unclear with respect to when the alternative testing must be conducted, the required frequency, and who makes the decision that a particular system is not testable. Additionally, Commenter 6 asserts that the alternative to secondary containment testing would be unnecessary if the secondary containment system was replaced with a testable system well before the July 1, 2005 deadline for replacement for non-testable systems.

Commenter 6 suggests that the alternative testing method be required once by December 31, 2003, unless the system is replaced by that date, in which case no alternative test need be required. Furthermore, Commenter 6 suggests that the owner/operator be allowed to determine whether or not their secondary containment system is testable, given the owner/operator's unique knowledge gained from operation and maintenance of the system.

Commenter 6 also says that subdivision 2637(a)(2) is worded such that a local agency may decide to choose the secondary containment testing method even in cases where there are manufacturers guidelines and standards, industry code, or engineering standard for the system being tested. Commenter 6 recommends that this subdivision be revised to clearly indicate that the need for local agency approval only applies if there is no applicable test method specified by the manufacturer or in an industry code or engineering standard.

Response:

Under Dispenser Containment

Comment: Commenter 6 states that the language in subdivision 2636(h)(3) appears to potentially prevent an owner/operator from installing any dispenser spill containment or control system unless it has been specifically approved by the SWRCB. As such, Commenter 6 suggests that the language be changed to clearly distinguish between third-party approved systems and new systems (i.e. alternative systems).

Response:

Enhanced Leak Detection

Comment: Regarding subdivision 2640(e)(1), Commenter 6 requests that siphon bars be included in the list of components not considered "single-walled."

Additionally, Commenter 6 requests that a performance based standard be substituted for the "prescriptive" standard set forth in the proposed subdivision 2644.1(a)(1) and (2). Commenter 6 claims that the only test method that could comply with the enhanced leak detection requirements is the tracer-based method licensed by Tracer Technologies. Furthermore, Commenter 6 asserts that tank and line integrity test methods can be third-party certified to meet the performance standards set for the subdivision 2644.1(a)(2).

Given the above, Commenter 6 recommends that the SWRCB eliminate subdivision 2644.1(a)(1) and retain subdivision 2644.1(a)(2) as the performance standard for enhanced leak detection. Commenter 6 argues that the establishment of a performance standard will provide more flexiblity to industry and encourage the development of less costly alternatives for enhanced leak detection.

Response:

COMMENTER 8

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 8 states that Contractors State Licensing Board (CSLB) had de-activated license C-61(D-40), which is one of the licenses listed as approved for annual monitoring maintenance inspectors. Commenter 8 further says if annual monitoring maintenance inspectors must be licensed this could be a financial hardship because some of Commenter 8's employees may not be able to get the license because they cannot afford and/or qualify for the bonds that are required.

Commenter 8 believes it should be the company that is licensed to do the annual monitoring maintenance certifications, and not the employee. As long as the employee maintains the manufacturers certification and the company maintains the license requirements, Commenter 8 asserts, the individual should be able to conduct the monitoring system certification.

Response:

COMMENTER 9

Secondary Containment Testing

Comment: Commenter 9 contends that the requirement for secondary containment testing six months after installation is unnecessary and imposes an additional inspection for local agencies to conduct on top of all of their other work. Furthermore, Commenter 9 says that local agencies are lucky if they even get the paperwork for the secondary containment test at installation within 6 months of the installation.

Additionally, Commenter 9 points out that under dispenser containment may not be testable because many flexible couplings, hose clamps, and other fittings are buried beneath the under dispenser containment. Because of this, Commenter 9 asserts, these components may degrade in this environment without detection and eventually fail.

Response:

Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 9 claims that the 48 hour notification of local agencies prior to conducting the annual inspection may not be sufficient for local agencies to schedule a visit during that time. Commenter 9 requests that the proposed regulations include a provision that allows the local agency to reset the schedule for the inspection so as to assure that staff will be present.

Response:

<u>**Under Dispenser Containment**</u>

Comment:

Commenter 9 expressed concern that the proposed definition of "Dispenser" may include emergency generator underground tank systems (and non motor vehicle tank systems), whereby the system pumps up to a day tank, or possibly directly to the receiving equipment, and there essentially is no dispenser. This may, Commenter 9 postulates, impose an unnecessary requirement for under dispenser containment for equipment that the law, and proposed regulations, did not intend. Commenter 9 says that such systems in its jurisdiction have historically not been addressed as dispensers, but may be considered such if the proposed definition is adopted.

Response:

<u>**Enhanced Leak Detection**</u>

Comment: Commenter 9 says that because the enhanced leak detection method identified in the proposed regulations is proprietary, and because it takes place over several days, it is difficult for local agencies to verify the what is going on during the test. Additionally, Commenter 9 asserts that, even though vent piping, and other components, are exempt from enhanced leak detection, they cannot be isolated. As such, Commenter 9 explains, the results of the test may falsely indicate (false-positive) that the tank or piping system is leaking, when actually the leaking "tracer" unknowingly came from come from one of the exempted components of the system.

Commenter 9 also expressed concern about the database that will be used for identification of underground storage tank facilities that will be required to conduct enhanced leak detection (those within 1000 ft of a public drinking water well). Specifically Commenter 9 is unsure about the timing and the type of data that will go into the database, and the nature and extent of conveying information back to the SWRCB.

Response:

COMMENTER 10

__Secondary Containment Testing__

Comment: Commenter 10 says that the requirement for triennial secondary containment testing for double-walled tanks is unnecessary. This is because, Commenter 10 asserts, a small hole in the top of the secondary containment will never be a problem, yet the secondary containment test will fail in this situation. Commenter 10 does acknowledge that secondary containment associated with pressurized piping and related components does need to be tested because of the complexities of these systems.

Response:

__Tank Installer Training__

Comment: Commenter 10 contends that the proposed recurrent training requirement for tank installers (section 2635(d)(1)) is unnecessary. This because, Commenter 10 asserts, underground storage tank tank technology has not, and probably will not, change much over the years, and thus the methods for installing these tanks essentially remains the same. Commenter 10 says that, simply put, underground storage tanks are set in the ground, compacted, and backfilled. Therefore, there are no new methods or techniques for installers to learn every three years.

Commenter 10 states that a lot of the re-training is occurring voluntarily and that it is not in the best interest of a tank installer to be part of a bad installation. Furthermore, Commenter 10 says that tank installers all work pretty hard to ensure that the tank installation is done correctly, without the need for a legal requirement for re-training.

Commenter 10 acknowledges that piping and related equipment do change frequently enough to require continuous refresher courses.

Response:

COMMENTER 11

Secondary Containment Testing

Comment: Referring to proposed subdivision 2637(a)(2), Commenter 11 says that allowing local agencies to decide on a test method for secondary containment testing may create inconsistencies throughout the state. Commenter 11 recommends that only the SWRCB act as the source of approval for test methods.

Response:

Under Dispenser Containment

Comment: Commenter 11 says that, in addition to the proposed requirement for under-dispenser containment, fill pipes and vent/vapor lines should also be required to be secondarily contained for newly constructed systems.

Response:

Enhanced Leak Detection

Comment: Commenter 11 states that subdivision 2640(e) is unclear as to where the measurement will be taken to determine if a single-walled tank facility is within 1000 ft of a public drinking water well. This is important, Commenter 11 notes, because underground storage tank owner/operators and local agencies may disagree on which sites qualify for the enhanced leak detection requirement due to differing beliefs regarding the appropriate point at the facility where the measurement should be taken (i.e. distance from well to property line, tank system, single-walled component etc).

Response:

COMMENTER 12

Tank Installer Training / Annual Monitoring Maintenance Inspector Requirements

Comment: Commenter 12 says that the proposed regulations are inadequate to address the number one performance indicator of underground storage tank systems – the quality of the installation and maintenance of these systems. The proposed regulations are inadequate, Commenter 12 asserts, because they still rely on the manufacturer of the equipment to provide the training, and this training may be insufficient to cover the complexities of tank installations and maintenance.

Commenter 12 points out that, while there are many good tank installer/testor contractors, there also many who do not understand the equipment and its limitations, nor do they understand state regulations as they relate to the installation. Rather, they follow a checklist, and if the tank system being installed or tested does not fit the parameters of that checklist, the installation may be deficient.

Commenter 12 recommends that the SWRCB impose additional quality control and quality assurance measures or procedures on individuals who will be installing, testing, and maintaining underground storage tank systems. Specifically, Commenter 10 suggests that manufacturers training programs be monitored and approved by the SWRCB to ensure the quality and effectiveness of these programs, and to get beyond the "checklist" mentality.

Response:

COMMENTER 13

Annual Monitoring Maintenance Inspector Requirments

Comment: Commenter 13 expressed concern regarding subdivision 2637(b)(1)(B) and (C) with respect to the following questions and issues:

1. Are certification programs offered by, or available from, all monitoring system manufacturers?

2. If so, Is January 1, 2002 the deadline by which the installer or maintenance technician must be certified?

3. What about other related tank, piping, dispensing equipment manufacturers certification program availability?

Commenter 13 also claims that some manufacturers of underground storage tank equipment will only train and certify certain select individuals or groups. Additionally, these certified persons may be required by the manufacturer to provide 24 hour maintenance service. If the proposed regulations are adopted as written, Commenter 13 asserts, they may allow manufacturers of monitoring equipment to control which companies will, or will not, receive the necessary certification training and authorization to conduct annual monitoring maintenance certification.

Commenter 13 recommends that the SWRCB require that all manufacturers of regulatory approved monitoring system equipment and related components offer, or make available, system certification training to any company properly licensed and qualified to provide maintenance services. Furthermore, Commenter 13 argues, this training should be provided without bias or unfair requirements as a condition of the certification.

Response:

COMMENTER 14

Secondary Containment Testing

Comment: Commenter 14 asked whether or not any type of sensor that recognizes the intrusion of ground water or product into the interstitial space of the secondary containment, would allow an exemption for that system from secondary containment testing.

Response:

Under Dispenser Containment

Comment: Commenter 14 says that the requirement for monitoring under-dispenser containment by an audible and visual alarm will necessitate installation of electrical conduit for dispenser pans that currently use the mechanical float shut-off switch. Commenter 14 asserts that in order to properly retrofit electrical conduit into a dispenser pan, the dispenser will have to removed and the integrity of the pan breached by the drilling of a new hole to accommodate the conduit, and the hole must then be made water-tight.

Furthermore, Commenter 14 states that the new electrical sensor will be almost useless because it will likely need to be installed above the float switch, since there is no room in the float bowl. As such, the mechanical float shut-off switch will activate and stop the leak prior to the leaking fuel rising high enough to trigger the electrical sensor. Finally, Commenter 14 claims that owners and operators may not have a monitoring panel that will accept the new electronic sensor and they would have to purchase another panel. This, Commenter 14 states, would be a huge burden given the owners and operators recently spent a lot money upgrading their systems to meet the December 22, 1998 upgrade requirements.

Given the above, Commenter 14 claims that the additional expenses incurred by the owner/operator to install the electronic sensor will be wasted because ultimately nothing is accomplished by installation of an ineffective electronic sensor.

Response:

COMMENTER 15

General Comments

Comment: Commenter 15 says that the proposed regulations, like the legislation that mandates them, are not drafted in consideration of nuclear power plants. Commenter 15 states the U.S. EPA, in recognition of strict UST construction requirements and oversight by the Nuclear Regulatory Commision, specifically exempted underground storage tanks serving emergency generators at nuclear power-plant facilities from federal underground storage tank regulations. As such, Commenter 15 urges California to adopt this federal standard, as have 48 other states, by amending the definition of "motor vehicle fuel tank" to exclude emergency generators that serve nuclear power-plant facilities.

Response:

<u>Under-Dispenser Containment / Enhanced Leak Detection</u>

Comment: Commenter 15 says that the proposed definition of "dispenser" should be clarified such that it may not be misinterpreted to include emergency generator fuel delivery systems that are not designed to be disconnected and re-connected such as at vehicle fueling or fuel transferring facilities. Or alternatively, Commenter 15 suggests that a specific exemption from the requirement for under-dispenser containment for UST systems supply fuel to emergency generators at nuclear plants. Commenter 15 recommends a similar exemption from the requirement for enhanced leak detection for emergency generator UST systems at nuclear power plants.

Response:

COMMENTER 16

<u>Secondary Containment Testing</u>

Comment: Commenter 16 says that secondary containment testing of double-walled underground storage tanks may be problematic, and is concerned as to how this test is going to be conducted. Commenter 16 asserts that, in order to apply pressure to the interstitial space the contents of the tank will need to be removed and if this is done, the residual vapors in the tank must be evacuated to mitigate the explosion hazard. Commenter 16 says that applying a vacuum to the secondary containment may be an effective test, even with product in the tank. However, Commenter 16 is unaware of any particular testing company that is third-party certified to conduct a 0.1 gph vacuum test at the 95/5 probability standard.

Response:

<u>Under-Dispenser Containment</u>

Comment: Commenter 16 says the underground storage tank systems that supply emergency generators don't have dispensers therefore they don't need under-dispenser containment.

Response:

COMMENTER 17

Secondary Containment Testing

Comment: Commenter 17 says that periodic testing of secondary containment systems for underground storage tanks already installed will likely entail a considerable cost for owners or operators, and not result is significant additional environmental protection. Commenter 17 states that the additional costs, aside from the test itself, will be incurred by the owner/operator having to make extensive modifications to the tank system in order to accommodate future secondary containment testing.

This is because, Commenter 17 asserts, double-walled tanks constructed in accordance with the Steel Tank Institute (STI) dual wall standard were shipped with the interstitial monitoring port flush with the top of the tank. This allowed owners/operators/installers to place various forms of release detection equipment into the interstice. Commenter 17 claims that, depending on the final design of the system at installation, 25% to 50% of currently installed double-walled tanks will require some additional work in order to perform the secondary containment test according to some STI members.

Commenter 17 says that these modifications may include removal of sumps, or where sumps have not been installed, cutting through concrete to get to the top of the tank to access the interstice. Furthermore, Commenter 17 points out, for those systems where the contractor extended the monitoring pipe to grade, such extensions were made liquid tight, but may not be pressure or vacuum testable without modifications. Commenter 17 says that the modifications described above will certainly generate some expense in order to comply with the new requirement.

Regarding the issue of environmental protection, Commenter 17 claims that the performance of STI labeled double-walled tanks renders the new requirement for periodic secondary containment testing unnecessary. Commenter 17 claims that over 60,000 STI labeled double-walled have been installed and there have been no reported incidents of a release from the primary tank into ground water.

COMMENTER 18

Secondary Containment Testing

Comment: Commenter 18 asserts that the requirements for secondary containment testing are too stringent for two key reasons: 1) any leak from the primary containmer would be contained by the secondary containment and detected by current leak detection methods; and 2) the probability of both the primary and secondary containers failing simultaneously is extremely low. Given the above, Commenter 18 suggests that the SWRCB re-consider the triennial testing frequency in favor of a longer frequency.

Commenter 18 suggests that the determination of the testing frequency should ideally be based on actual or predicted data on the occurrence of failures in both containment systems. However, in lieu of this information Commenter 18 recommends a frequency of 10 years, and suggests requiring additional monitoring such as SIR as further verification that releases are not occurring into the secondary containment system with this reduced testing frequency.

Response:

Under-Dispenser Containment

Comment: Commenter 18 says the since the requirement for under-dispenser containment will necessitate retrofitting existing facilities, the SWRCB should allow flexibility when approving under-dispenser containment system. Commenter 18 note that there is technology available that uses liquid polymers that solidify into an effective product-tight contaiment. This flexibility, Commenter 18 asserts, will allow avoid the need to rebuild islands and hence avoid the closing of facilities that cannot handle the extra cost involved.

Response:

Enhanced Leak Detection

Comment: Commenter 18 says that the SWRCB should reconsider using tracers to meet the enhanced leak detection requirement. Commenter 18 is unaware of any reliable tracer methods for use with underground storage tank systems. Additionally, Commenter 18 claims that this technology leads to many false positieves (i.e. detections) and the method is relatively difficult of perform correctly. Furthermore, Commenter 18 is concerned about the method's reliability in either clay or saturated soils. Finally, Commenter 18 asserts that this method is designed to detect product in soil rather than losses (from the tank). Commenter 18 prefers methods that detect releases, so that there is opportunity to correct potential leakage problems before product can be detected in soils.

Response:

Tank Installer Training

Comment: Although Commenter 18 believes that a requirement to ensure that installers are qualified to properly install underground storage tanks is appropriate, Commenter 18 believes the proposed requirement for triennial re-certification is unnecessary (except possibly for inexperienced installers). Commenter 18 suggests that experienced installed should only be required to demonstrate that they have been actively installing tanks over the previous three years. Commenter 18 says this would minimize the burden to installers while still meeting the intent of the law.

Additionally, Commenter 18 notes that the requirement is for each individual manfacturer to provide training. Because there are many manufacturers of underground storage tank systems, Commenter 18 says that the proposed rule would benefit by streamlining the requirement to a single provider of this training for all or most UST systems, with the specifics of individual systems highlighted. Commenter 18 says that this would eliminate the need for installers to be certified by multiple manufacturers.

Response:

COMMENTER 19

Enhanced Leak Detection

Comment: Commenter 19 says that, because the proposed requirements for enhanced leak detection mandate an external method using a chemical marker, the SWRCB has an opportunity to take better advantage of the sensitivity capability of this method by requiring an even lower maximum leak rate. Commenter 19 says that the lowest sensitivity for this leak detection method recognized by a third party evaluated is 0.005 gallons per hour, with a probability of detection of 97% and probability of false alarm of 3%. Commenter 19 points out that this amounts to a leak of only 44 gallons per year versus 440 gallons per year with the 0.05 limit set forth in the proposed regulations.

Commenter 19 says that lowering the sensitivity requirement for enhanced leak detection will not exclude any methods or technologies that the proposed standard would include. Furthermore, Commenter 19 claims that a more stringent sensitivity requirment may spark innovation in a variety of competing technologies with the potential of bringing leak detection to a new level across the board.

Response:

COMMENTER 20

Enhanced Leak Detection

Comment: Commenter 20 says that at the staff level hearing held last October 27 for enhanced leak detection, it presented proposed alternatives to the "sole source" method included in the proposed regulations. Commenter 20 states that it has received a number of inquiries from its customers regarding whether or not its proposed alternative methods will be acceptable for enhanced leak detection. Commenter 20 urges the SWRCB to re-consider giving owners and operators of underground storage tanks the option to us any combination of the following methods as a substitute to the external method mandated in the proposed regulations:

1. Third-party monitoring
2. More frequent precision testing of lines at 0.2 gallons per hour bimonthly or weekly
3. More frequent Continuous Statistical Leak Detection i.e. either daily, weekly, etc.

Commenter 20 asserts that there are simply not enough options included in the proposed regulations to test or monitor the secondary containment to meet enhanced monitoring/testing requirement. Commenter 20 urges the SWRCB not to "sole source" enhanced leak detection, and recommends that the SWRCB set a general standard and let industry propose alternatives that meet or exceed the standard.

Response:

COMMENTER 21

Secondary Contaiment Testing

Comment: Commenter 21 says that it seems likely that the SWRCB would prefer replacement of secondary containment systems that cannot be tested, such as lined trench systems, than to have ongoing alternative testing for these systems. Commenter 21 suggests that where an owner/operator commits to replacement of the non-testable secondary containment system by a certain date or year in advance of the July 2005, they should be exempt from the testing requirement. Additionally, Commenter 21 recommends that where a system cannot be tested but the owner/operator agrees to take the route of enhanced leak detection, the requirements should state that only one test is required since. This is because, Commenter 21 notes, there would be no benefit to conducting a second test for a system that will be removed by July 2000.

Commenter 21 also says that, in subdivision 2637(a)(2), the current proposed language authorizes a local agnecy to proceed to specify a test method even though manufacturer's guidelines, industry codes or engineering standards already exist. Commenter 21 recommends that this language be revised to clearly state that the local agency can only specify the method if where manufacturers guidelines, industry codes, or engineering standards do not exist.

Response: See commenter 7

Under-dispenser Containment

Comment: Commenter 21 says that, according to existing state policies (May 17, 1995 LG letter) dispenser installed after August 1, 1995 are required to have under-dispenser containment. Commenter 21 further states that the January 2000 date included in the proposed regulations seems at odds with current requirements and would be retroactive from the perspective of the proposed rulemaking.

Additionally, Commenter 21 asserts that because existing subdivsion 2636(f)(3) allows some flexibility for the monitoring of piping, it would be appropriate to grant similar flexibility to under-dispenser containment. As such, Commenter 21 proposes that under-dispenser monitoring systems that shut down the dispenser in the event of a leak, be allowed in lieu of monitoring by an audible and visual alarm.

Commenter 21 further claims that the proposed requirement (in subdivision 2636(h)(3)) for approval by the SWRCB of under-dispenser spill control or containment systems apparently does not make allowance for third-party approval for acceptability of these systems. Commenter 21 suggests that the language be revised to specifically reference the acceptability of third-party approvals.

Finally, referring the subdivisions 2666(a), (b), and (c), Commenter 21 notes that since the dates identified in these subdivisions (December 22, 1998) are behind us, the wording of these regulations should be expressed differently.

Response:

Enhanced Leak Detection

Comment: Commenter 21 recommends that "siphon piping" be included in the list of components not considered single-walled components in subdivision 2640(e)(1). This is because, Commenter 21 notes, "siphon piping" operates at a negative pressure much like suction piping, and connects two underground storage tanks across the top of the tanks. Commenter 21 says that if a leak were ever to develop, the siphon would be broken and the liquid in the siphon lines would merely drain back in to each of the two tanks.

Regarding the required method for enhanced leak detection, Commenter 21 strongly believes that it is inappropriate for the State to impose any sort of requirement that can only be conducted by a single contractor. Commenter 21 says that there is a demonstrable need for other choices because there are certain site-specific conditions where the prescribed method. Other methods, Commenter 21 notes, do exist or may become available that may offer comparable assurances regarding the integrity of UST systems.

Additionally, Commenter 21 says that the SWRCB is about the embark on an extensive, statewide, field-based research program being conducted by the only known company that can conduct the prescribed enhanced leak detection method. Commenter 21 states that the experience gained in doing this research should be able to determine if this method is actually as effective and reliable as claimed, and the SWRCB should delay mandating this method until these results are in. Finally, Commenter 21 asserts that the statement of reasons identifies a triennial frequency but this has not been included in the proposed regulations. Commenter 21 believes that a triennial frequency is not unreasonable and that it should be made clear in the proposed regulations.

Response:

Annual Monitoring Maintenance Inspector Requirements

Comment: Referring to subdivision 2637(b)(1)(C), Commenter 21 states that manufacturers may conduct refresher training more frequently than triennnially. Therefore Commenter 21 recommends that the language be revised to require that the refresher certification occur <u>at least</u> every 36 months. Additionally, Commenter 21 says that the proposed requirement in subdivision 2637(b)(4) that owners/operators notify the local agency 48 hours in advance of conducting the work may actually delay that are needed immediately. Therefore, Commenter 21 recommends that the language be revised to only require announcements for repairs that have already been scheduled.

Additionally, Commenter 21 says that the requirement for putting a tag or sticker on equipment that has been inspected (subdivsion 2637(b)(1)(5) does little to ensure that the inspection and certification was proper. Furthermore, this is a cumbersome process for annual monitoring maintenance inspectors, introduces additional potential compliance problems, says Commenter 21, and should be replaced with a simpler tracking requirement.

Response:

<u>Tank Installer Training</u>

Comment: Referring to subdivision 2635(d)(1) Commenter 21 claims that tanks and piping may be made by different manufacturers, and these manufacturers may conduct more frequent refresher training than triennially. Therefore Commenter 21 recommends that the language be revised to require that the refresher certification occur <u>at least</u> every 36 months.

Response:

COMMENTER 22

<u>General Comments</u>

Comment: Commenter 22 presented oral comments at the public hearing, and resubmitted written comments to the proposed regulations that had been given to the SWRCB prior to publication of the Notice of Proposed Rulemaking. The written comments were originally submitted in response to a pre-NPRM draft regulatory package the SWRCB gave to select parties to review prior to formal publication. Since the proposed regulations that were finally included in the NPRM were revised from the pre-NPRM draft, some of Commenter 22's comments are irrelevant since they include responses to proposed regulations, and amended section numbers, that were not contained in the final NPRM. These include comments about proposed regulations regarding inspection of cathodic protection systems and UST equipment compatibility and permeability relating to changing fuel formulations.

Commenter 22 also mentioned the absence of certain regulations in the draft package that were mandated by Senate Bill 989. These included regulations regarding under-dispenser containment, training for local agencies and UST owner/operators, and local agency periodic UST facility inspections. Finally, Commenter 22 also remarked about the requirement in SB 989 that the SWRCB conduct a field based research program that would "seek to identify the source and causes of releases and any deficiencies in leak detection systems."

Response:

<u>Secondary Containment Testing</u>

Comment: Commenter 22 says that there should be leeway granted for the development, issuance and transfer to UST agencies of an electronic version of the "monitoring system certification form.

Response:

Enhanced Leak Detection

Comment: Commenter 22 says the SWRCB's reasoning in establishing the 0.05 leak detection rate for enhanced leak detection may be flawed. This is because, Commenter 22 notes, the SWRCB based the leak detection rate on information indicating that underground storage tanks may be leaking (undetected) below the current maximum leak rate sensitivity (0.1). However, Commenter 22 points to studies that indicate that many UST leaks that are discovered when the tank system is removed, are the result of disconnected/disabled leak detection devices. Commenter 22 says that the SWRCB may be invoking more onerous measures due to a theory not based on facts.

Commenter 22 also expressed significant concern the proposed requirement for enhanced leak detection can only be met by one method, and perhaps one vendor. Commenter 22 asserts that the SWRCB should give additional consideration to the benefits of tighter internal detection methods, such as more periodic automatic tank guage testing, as an alternative method for enhanced leak detection. Commenter 22 states that even though increased fasle-alarms may occur for these UST siotes in sensitive areas, further investigation should be mandated. Finally, Commenter 22 says that the SWRCB did not require that enhanced leak detection be conducted periodically, and additional periodic enhanced leak detection should be required, no less than every 3 years between events.

Response:

Tank Installer Training

Comment: Commenter 22 says that the proposed additional requirements for tank installer training should cover all activities related to repairs and upgrades under Article 6.

Response:

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

TABLE OF SWRCB RESPONSE TO COMMENTS
15-DAY COMMENT PERIOD #1 (November 22 to December 11)

COMMENTERS

NUMBER	NAME
1	BP Western Region
2	County of Los Angeles
3	County of Orange
4	Dennis Rock
5	Modern Welding
6	Pearson Equipment and Maintenance
7	Southern California Technical Advisory Group
8	Tosco
9	Western States Petroleum Association

STATE WATER RESOURCES CONTROL BOARD
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SWRCB RESPONSES TO COMMENTS ON PROPOSED SB 989 REGULATIONS
15-DAY COMMENT PERIOD # 1 (November 22 to December 11, 2000)
SORTED BY SECTION

Section / subject	Comment Number	Summary of comment	Response	Revision needed
2611 / under-dispenser containment	9 - 01	Reword the term "dispenser spill containment or control system" in order to enhance the distinction between it and "under-dispenser containment".	**Accepted**	Revised definitions in 2611 accordingly
2630 / general applicability of article	9 – 02	For 2630(a) include a specific effective date, or, to reference the definitions of new ust and/or existing usts (i.e., "... Owners of new underground storage tanks <u>(as defined in section 2611)</u>".	**Rejected:** not a comment on the proposed regulations	None
2630 / under-dispenser containment	8 - 01	Regarding 2630(d) further clarification is required. The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies	**Rejected:** the language means that the agency approved monitoring equipment must be installed in such a manner that it detects a leak at the earliest possible opportunity in accordance with the performance characteristics of the equipment	None
2635 / tank installer training	3 - 01	Sections 2635(d) and 2636(c) state that owners or their agents shall certify that installation of tanks and piping shall be made on form c. The cupa forms are now used in place of "form c" and the language should be changed to reflect this.	**Rejected:** not a comment on the regulations	None
2636 / under-dispenser containment	3 - 02	Section should be clarified to read "underground piping with secondary containment, including under-dispenser piping with secondary containment shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section."	**Rejected:** not a comment on the proposed regulations.	None
2636 / under-dispenser containment	3 - 03	Section 2636(f)(3) should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe.	**Rejected:** we specifically worded the revisions such that both mechanical and electrical dispenser shut-off devices would continue to be allowed for monitoring. This would not be the case if recommended language was included.	None

2636 / under-dispenser containment	3 - 04	Section 2636(g)(3) should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe.	Same comment as 3 – 03.	None
2636 / under-dispenser containment	7 – 01	Section 2636(f) should be clarified to readily indicate what monitoring options available.	Same as comment 3 - 02	Same
2636 / under-dispenser containment	7 - 02	Change section 2636(g)(3) to read "all continuos monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **to** the dispenser when they detect a leak.	Same as comment 3 - 03	Same
2636 / under-dispenser containment	8 - 02	2636 (h)(1)(b) should be amended to read ", as **correctly** identified and **confirmed** pursuant to the state geographic information system mapping database and reference section 2640(e)(2)&(3) which allows for correction of either distance to a public drinking water well or the existence of single walled components.	**Rejected:** a "correct" identification of a facility pursuant to the gis database is implicit in the regulation and does not need to be specified.	None
2636 / under-dispenser containment	9 - 03	It would seem to be necessary to specify that, in 2636(f), the requirements for monitoring also apply to dispensers equipped with the alternative spill containment system.	**Accepted**	Section 2611 will be amended accordingly
2636 / under-dispenser containment	9 - 04	Regarding 2636(g)(4) there appear to be practical problems with the requirement that the "pumping system shuts down automatically if *any* of the continuous monitoring systems for the piping fail or are disconnected"	**Rejected:** the regulatory language that is the subject of the comments is outside the scope of the proposed regulations.	None
2636 / under-dispenser containment	9 - 05	Regarding comment 9 – 04, although the goal of this requirement is noteworthy, we are not aware of any currently-available system which can detect the failure of a component or tampering.	**Rejected:** the regulatory language that is the subject of the comments is not part of the proposed regulations.	None
2637 / annual maintenance certification	3 - 06	Section 2637(b)(1) needs to clarify who is required to have the license, the company or the individual.	**Clarification:** same as 45-day comment s1 – 04.	Same as 45-day comment s1 - 04

2637 / annual maintenance certification	3 - 07	Section 2637(b)(2) states that the annual monitoring certification shall be made on the monitoring system certification form. This section should read "all monitoring equipment certification shall be made on …", instead of only "annual monitoring equipment certification shall…".	**Rejected:** the local agency has the option of requiring that all maintenance work be recorded on the monitoring system certification form and therefore, we do not see any reason to included this additional requirement in the regulations.	None
2637 / annual maintenance certification	6 - 01	See 45-day comments 113 – 01, 02, 03, and 04.	Same as 113 – 01, 02, 03, and 04.	None
2637 / annual maintenance certification	7 - 07	Change section 2637(b)(2) to read "<u>all</u> monitoring equipment certification<u>s</u> shall be made on a "monitoring system certification" form (see appendix vi).	Same as comment 3 - 07	Same
2637 / annual maintenance certification	8 - 06	Regarding appendix vi - don't see when the ust monitoring plot plan would be used since all sites must have monitoring and hazardous material management plans (hmmps).	**Clarification:** the annual monitoring maintenance inspection form (app v1) is a separate document from the monitoring plot plan, which is required as part of the permitting process.	None
2637 / annual maintenance certificaton	7 - 06	Regarding section 2637(b)(1) We want to ensure has the <u>training</u> is mandated for hands-on technicians, but not the owner of the company for whom the technician works.	**Accepted**	Revised 2637(a)(1) to clarify as suggested
2637 / secondary containment systems	9 - 07	2637(a)(1). This section requires untestable systems be replaced. There will be cases where it should be feasible to "repair, modify, or upgrade" some types of existing systems so that they can be appropriately tested. We request that such an allowance be added.	**Rejected:** this is already allowed in the proposed regulations. If the seondary containment system can be repaired, modified, or upgraded so that it becomes testable, this would meet the requirement of "replacement."	None
2637 / secondary containment test9ing	2 – 01	We request that the local agency be allowed a minimum of 60 days to process the approvals required by section 2637(a)(1).	**Accepted in part:** 45 days. The full 60 days is denied becaise: 1) we expect the workplans to be reasonably short and simple; and 2) we do not want to unnecessarily delay implementation of the workplans	Revised section 2637(a)(1) to allow 45 days
2637 / secondary containment testing	1 - 01	The proposed requirement that "secondary containment systems shall be tested to criteria no less stringent than those used at installation" may severely limit the periodic testing resulting in a defacto requirement to replace nearly all of the secondary containment systems	**Rejected:** the no less stringent criteria will not severely limit the ability to test secondary containment systems nor result in a "de-facto" requirement to replace secondary containment systems statewide.	None

2637 / secondary containment testing	3 - 05	Regarding 2637(a)(1), the local agency should be allowed 60 days to respond to submittals due to the number of proposed workplans and programs that we may receive.	Same as comment 2 – 01.	Same as comment 2 - 01
2637 / secondary containment testing	7 - 03	For section 2637(a)(1), change the local agency review time to 60 days	Same as comment 2 - 01	Same
2637 / secondary containment testing	7 - 04	Change section 2637(a)(2) to allow approval of method by local agency	**Rejected:** since the local agency reviews and approves these monitoring and response plans during the permitting process, there is no reason to specifically require local agency approval in the secondary containment testing regulations	None
2637 / secondary containment testing	7 - 05	Does "state registered professional engineer" mean california or any state?	**Answer:** this is specific to california	None
2637 / secondary containment testing	8 – 03	Regarding 2637(2) for most pieces of equipment, the manufacturer will have test criteria for post installation testing, but his might not be "no less stringent then those used at installation."	Same as comment 1 - 01	Same
2637 / secondary containment testing	9 - 06	Regarding 2637(a). Because the amendments will not be approved by oal until after january 1, 2001, it would seem appropriate to change the effective date, from january 1, 2001, to "... Six months after the date of adoption "	**Rejected:** not necessary. Those ust systems installed after january 1, 2001 will **not** be required to conduct the six-month follow up test if the proposed regulations do not become law within six months of that particular installation.	None
2637 / secondary containment testing	9 - 08	Regarding 2637(a)(2), the requirement that systems be "tested to test criteria no less stringent than those used at installation" is vague and there might be cases where there is a conflict with a manufacturer's post-installation testing guidelines	Same as comment 1 - 01	Same
2637; 2644.1 / secondary containment testing, annual maintenance certification enhanced leak detection	2 - 02	We therefore request that the minimum inspection notification period be increased to 72 hours, or a statement be inserted to allow a local agency to specify a longer notification period.	**Rejected:** local agencies already have the authority to either waive the notification requirement, or increase it, thus there is no need for a specific provision in the regulations.	None

2640 / enhanced leak detection	3 - 08	Section 2640(e)(2) should include a time frame for swrcb review of appeals so that the local agency knows when to require compliance.	**Accepted**	Revised 2640 to req. Swrcb review within 90 days
2640 / enhanced leak detection	7 - 08	Change section 2640(e)(2) to include a 90 day timeline for response by the program manager.	**Accepted**	Revised 2640(e)(2) accordingly
2644.1 / enhanced leak detection	1 - 03	The agency has now proposed an even more stringent leak detection criteria of .005. We are concerned that this mandated monopoly will result in unreasonable pricing.	**Rejected:** same comments as 45-day LS20 – 01, and LS21 – 09.	None
2644.1 / enhanced leak detection	5 – 01	The comment is in regards to subsection 2644.1(a)(2). The new proposed leak of 0.005 is not attainable and should be put on the back burner until such time as industry has time to verify that such equipment exists by more than one manufacture.	**Rejected:** the proposed method was chosen because, among other reasons, it was capable of being third-party certified to a leak rate sensitivity of 0.05 gph, and recently has been third-party certified to a leak rate sensitivity of 0.005 gph.	None
2644.1 / enhanced leak detection	8 – 04	Regarding 2644.1(a)(2), we are opposed to reducing the leak detection standard to .005 gph because even a 5% false alarm rate will be very costly when considering excavation to address "apparent" ust system leaks.	**Rejected:** the 95/5 reliability standard is the same standard that is used for all other ust monitoring, thus the assertion that the proposed method has a "high degree" of false positives is misleading, since we expect there to be no more than for any other third-party-approved monitoring method	None
2644.1 / enhanced leak detection	8 - 05	The state should confirm that any proposed monitoring standard is achievable by more than one company. We are concerned that these low standards will create a monopoly for the tracer tight technology.	Same as 45-day comment L20 - 01	Same
2644.1 / enhanced leak detection	9 - 09	Regarding 2644.1(a)(1), there is, to the best of our knowledge, only one technology which fully meets the criteria as set forth in this section and we are concerned about being "married" to a sole-source supplier.	Same as 45-day comment L20 - 01	Same
2644.1 / enhanced leak detection	9 - 10	The swrcb is currently embarking on its field-based research program using the proposed enhanced leak detection method and requirement of this method should be delayed until these results are in.	Same as 45-day comment LS21 - 10	None

2644.1 / enhanced leak detection	9 - 11	Regarding 2644.1(a)(2), the change. To a level of 0.005 gph, results in facilities being "wedded" to a sole-source supplier to an even greater degree.	Essentially the same comment as 45-day L20 - 01	None
26440 / enhanced leak detection	1 - 02	We do not know how to appeal the enhanced leak detection requirement for those systems that will be re-constructed to double-walled structures following the gis notification but prior to the enhanced leak detection deadline.	**Clarification:** same comment as 45-day LS21 – 16.	None
266o / under-dispenser containment	9 - 12	Regarding 2660(h) change the second sentence to read as follows: "requirements for under-dispenser containment, or under-dispenser spill control systems, shall be completed no later than december 31, 2003."	**Accepted**	Revised 2660(h) accordingly
General comments on chapter 16	4 - 01	General comments	**Rejected:** mostly not comments on proposed regulations, no explanation given for other comments.	None

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #1
(Comments submitted between November 22 and December 11, 2000)

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments.

	NAME	DATE
1	BP Western Region	December 11, 2000
2	County of Los Angeles	December 11, 2000
3	County of Orange	December 11, 2000
4	Dennis Rock	December 11, 2000
5	Modern Welding	December 11, 2000
6	Pearson Equipment and Maintenance	December 4, 2000
7	Southern California Technical Advisory Group	December 11, 2000
8	Tosco	December 11, 2000
9	Western States Petroleum Association	December 11, 2000

COMMENTER 1

Secondary Containment Testing

Comment: Regarding section 2637, Secondary Containment Testing, particularly (a)(2), proposed requirement that "Secondary containment systems shall be tested to test criteria no less stringent than those used at installation." This is a new provision that was not contained in the original proposal. While we understand the intent of the provision and the need for pre-determined testing criteria, we are concerned that this provision severely limits the possibility of testing existing systems on a periodic basis, thus resulting in a defacto requirement to replace nearly all of the secondary containment systems at all RGO's throughout the state. We do not believe that such a requirement was contemplated by the legislature in SB 989, nor that such a cost was considered in the impact analysis.

As you may know from talking with other industry representatives and tank manufacturers, the industry is working to develop various alternative testing methods for existing secondary containment systems. We believe the proposed requirement should satisfy the following objectives: 1 - 01

- Ensure that approval of testing methods/standards is conducted by the State rather than diverging local agencies.
- The testing criteria/method/standard must ensure the integrity of the secondary system.

- Flexibility is provided for the actual development of testing methods so that industry is incentivized to find a solution(s) that ensures systems are leak-tight while allowing existing systems to remain viable.

We recommend that the agency reach out to tank equipment manufacturers for suggestions as to how the regulations can be structured to meet the objectives outlined above.

Response:

1 – 01: The *provision that periodic secondary containment testing* be conducted *in accordance* with criteria no less stringent than those used at installation will not severely limit the ability to test secondary containment systems nor result in a "de-facto" requirement to replace secondary containment systems statewide. Although we agree that many systems will need to be upgraded in order to be tested adequately, this would be the case regardless of this provision.

The point of periodic secondary containment testing, and the intent of the legislation, is to ensure that secondary containment systems continue to perform as designed throughout the life of the UST system. This goal, by default, means that the secondary containment system must continue to perform to the same standards of component integrity as those used at installation. This also holds true for primary containment systems, or any other component that is used in the UST system installation. The provision was inadvertently omitted from the original set of proposed regulations

We agree that the practical matter of implementing this standard on existing secondary containment systems that were not designed to be periodically tested will present unique technical challenges. These challenges will need to be met through close cooperation and coordination between the SWRCB, local agencies, and industry.

The term "criteria" does not necessarily mean method. In fact for many systems it would be impossible to use the same method as that used at installation (i.e. turbine and fill sumps). Additionally, many underground tank secondary containment systems are initially tested by pressure prior to installation, but cannot be tested in this manner while the tank contains fuel. The term "criteria" does mean that the test that is conducted on the secondary containment must be able to show that the system is performing as well as it did at installation.

For example, in the case of a turbine sump that was hydrostatically tested prior to installation using visual inspection of the exterior to determine if it leaked, the subsequent hydrostatic test will need to be developed such that it accounts for absence of exterior visual inspection. This will likely mean that the test will take much longer than the initial test and rely on declining water levels (or lack thereof) to asses the integrity of the system. The details regarding how the initial test and the subsequent tests compare in terms of performance criteria will be part of test development. The same testing logic also applies to UST's with secondary containment systems that cannot be tested by pressure after installation, but can be tested by vacuum.

Result: No changes.

Enhanced Leak Detection

Comment: Regarding section 2640(e), "An owners or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well, as notified by the board according to its GIS mapping database, shall implement a program of enhanced leak detection ..." This section also includes an appeal process for operators that believe their facility is not subject to this requirement, i.e. is not a single-walled within 1,000 feet of a well.

We are concerned that the proposed appeals process does not envision BP's particular situation – we are in the process of upgrading all of our single-walled systems to double-walled systems to be completed mid-year of 2001. Given the proposed appeals process, we do not know how to appeal the enhanced leak detection requirement for those systems that will be re-constructed to double-walled structures following the GIS notification but prior to the enhanced leak detection deadline. We recommend that the proposed rules contemplate this and other situations that will be encountered. 1 - 02

We note that despite industry's strong and long-time objections to the sole-source mandate of Tracer Tight Testing for purposes of enhanced leak detection, the agency has now proposed an even more stringent leak detection criteria of .005, thus further locking out any potential competition to this patented technology. We are concerned that this mandated monopoly will result in unreasonable pricing on the backs of independent marketers and dealers. 1 - 03

Response:

1 – 02: Same comment as 45-day LS21 – 16.

1 – 03: Same comments as 45-day LS20 – 01, and LS21 – 09.

Result: No changes.

COMMENTER 2

Secondary Containment Testing, Anuual Maintenance Certification, and Enhanced Leak Detection

Comment: Based on our experience in December 1998, we expect a considerable number of owner/operators will wait to the last minute to submit for approvals. We therefore request that the local agency be allowed a minimum of 60 days to process the approvals required by Section 2637(a)(1). 2 - 01

In addition, our engineering and inspection scheduling staff works a ten-hour, four-day-week, as do a number of cities that fall within our UST jurisdiction. We therefore request that the minimum inspection notification period be increased to 72 hours, or a statement be inserted to 2 - 02 allow a local agency to specify a longer notification period. Notification alone is not sufficient to schedule an inspection, we must agree to the proposed schedule. This appears in Section 2637(a)(5); 2637(b)(40; and 2644.1(a)(4).

Response:

2 – 01: We agree with this comment in part, and will revise the proposed regulations to allow 45-days for local agency review of enhanced leak detection workplans. The full 60 days is denied for two reasons: 1) we expect the enhanced leak detection workplans to be reasonably short and simple; and 2) we do not want to unnecessarily delay implementation of the workplans.

2 – 02: Local agencies already have the authority to either waive the notification requirement, or increase it, thus there is no need for a specific provision in the regulations.

Result: Section 2637(a) will be revised to allow local agencies 45-days to review enhanced leak detection workplans.

COMMENTER 3

Tank Installer Training

Comment: Sections 2635(d) and 2636(c) state that owners or their agents shall certify that the installation of tanks and piping shall be made on the Certificate of Compliance for Underground Storage Tank Installation Form C. 3 - 01

The Unified Program Consolidated forms are now used in place of "Form C". The language should be changed to the Underground Storage Tank Installation– Certificate of Compliance.

Response:

3 – 01: We agree with this comment. However, the development of the Certified Unified Program Agency program has rendered many similar provisions in the underground storage tank regulations obsolete, and to only change one at this point would create additional inconsistency in the regulations. When Chapter 16 is fully updated, all of these outdated provisions will be revised.

Result: No changes.

Under-dispenser Containment

Comment: Section 2636(f) is meant to define additional requirements for dispenser containment systems without audible visual sensors (i.e. mechanical floats). Dispenser containment without audible visual sensors would be required to comply with 2636(f)(1) through (4) of this section.

It is our opinion that this section is meant to give a choice between 2636(f)(2) or (3). It should be clarified to read "Underground piping with secondary containment, including under-dispenser piping with secondary containment shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section." 3 - 02

Section 2636(f)(3) states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2).

The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. 3 - 03

Section 2636(g)(3) states: "All continuous monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **at** the dispenser when they detect a leak".

The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. 3 - 04

Section 2637(a)(1) allows only 30 days for the local agency to review the proposed enhanced leak detection program.

We feel that the local Agency should be allowed 60 days to respond to submittals due to the number of proposed workplans and programs that we may receive. 3 - 05

Response:

3 – 02: Not a comment on the proposed regulations.

3 – 03: In clarifying the requirements for monitoring of under-dispenser containment we specifically worded the revisions such that both mechanical and electrical dispenser shut-off devices would continue to be allowed for monitoring. This precluded using "to" the dispenser since that language would bar electronic devices which shut-off electricity to dispenser, rather than shut-off the flow of product to the dispenser. Shutting down the dispenser by cutting off electricity effectively shuts off product flow "at" the dispenser. Additionally, requiring turbine pump shutdown in response to a leak into the under-dispenser containment would have precluded the use of mechanical float shut-off switches too.
Current piping monitoring requirements require turbine pump shut-down in the event of a leak in the piping, activated by a sensor in the turbine sump, or a line leak detector. If a sump sensor is used, there is a remote possibility that the leak will go undetected if the leak occurs between the

double-walled main piping and the dispenser shear valve. Although unlikely, we are aware of leaks under these conditions where fuel has collected in, and overflowed, the dispenser pan. However, this situation is essentially an explosion and fire hazard and thus best dealt with through local fire codes rather than water quality regulations.

3 – 04: Same as comment 3 – 03.

3 – 05: Same comment as 2 – 01.

Result: No changes.

Annual Maintenance Certification

Comment: Section 2637(b)(1) requires persons performing installation, repair, maintenance, calibration or annual certification shall meet certain licensing requirements. 3 - 06

This section needs to clarify who is required to have the license. In most cases, one individual in the company holds the license and the technicians that perform the certifications are trained on the manufacturer's requirements. As this section is written, it appears that each individual technician shall hold a license. This is not feasible for companies that perform monitoring certifications.

Section 2637(b)(2) states that the annual monitoring certification shall be made on the Monitoring System Certification form.

Many times a monitoring system may be repaired, reprogrammed or reinstalled during the year. 3 - 07
It is our opinion that this section should read "All monitoring equipment certification shall be made on …", instead of only "Annual monitoring equipment certification shall…".

Response:

3 – 06: Same comments as 45-day S1 – 03.

3 – 07: The local agency has the option of requiring that all maintenance work be recorded on the Monitoring System Certification form and therefore, we do not see any reason to included this additional requirement in the regulations. The Monitoring System Certification form was developed specifically for ensuring the annual monitoring maintenance requirement was completed properly and all work and results accurately documented.

Result: No changes.

Enhanced Leak Detection

Section 2640(e)(2) regarding a request for reconsideration for enhanced leak detection requirements has been amended to remove the 30 calendar day response time by the Clean Water Programs UST Program Manager. 3 - 08

We feel that there should be a time frame so that the local Agency knows when to require compliance.

Response:

3 – 08: We agree with this comment.

Result: Section 2640(e)(2) will be revised to require the SWRCB to review enhanced leak detection appeals.

COMMENTER 4

Commenter 4 submitted a copy of several sections of the underground storage tank regulations, including many sections that are proposed to be amended, with suggested edits. No supporting statement of reasons was submitted with these "comments", and as such, the SWRCB is rejecting all of them.

COMMENTER 5

Enhanced Leak Detection

The comment is in regards to subsection 2644.1(a)(2). The new proposed leak rate we received today states 0.005 gallon per hour. I have talked to third party certification people this morning and they do not think 0.01 is attainable as there has been talk in another state of this goal. They do know that they have methods and procedures to certify 0.05 equipment. I believe that the 0.005 leak detection rate should be put on the back burner until such time as industry has time to verify that such equipment exists by more than one manufacture. 5 - 01

Response:

5 – 01: The proposed method for enhanced leak detection was chosen because, among other reasons, it was capable of being third-party certified to a leak rate sensitivity of 0.05 gph, and recently has been third-party certified to a leak rate sensitivity of 0.005 gph. As such, this method is the current best available technology.

Result: No changes.

COMMENTER 6

Secondary Containment Testing

Comment: Commenter 6 re-submitted the same comments it submitted for the 45-day comment period (see 45-day Commenter 13.) 6 - 01
Response: Same.

Result: No changes.

COMMENTER 7

Under Dispenser Containment

Comment:

Change Section 2636(f) to read:

> "Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems **in compliance with either 1,2 and 4 or 1,3 and 4 of the following:"** 7 - 01

Change Section 2636(g)(3) to read:

> "All continuos monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **to** the dispenser when they detect a leak." 7 - 02

Response:

7 – 01: Same comments as 3 – 02.

7 – 02: Same comments as 3 – 03.

Result: No changes.

Secondary Containment Testing

Comment:

Change Section 2637(a)(1) to read:

> "The local agency shall review the proposed program of enhanced leak detection within **60** days of submittal or re-submittal." 7 - 03

Change Section 2637(a)(2) to read:

> Secondary containment systems shall be tested to test criteria no less stringent than those used at installation **<u>and approved by the local agency.</u>** ....If there are no manufacturer's guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer **<u>and approved by the local agency.</u>** 7 - 04

Does "state registered professional engineer" mean California or any state?? 7 - 05

7 – 03: Same comments as 2 – 01.

7 – 04: Secondary containment testing is included in the monitoring and response plan, which all UST facilities must have. Since the local agency reviews and approves these monitoring and response plans during the permitting process, there is no reason to specifically require local agency approval in the secondary containment testing regulations.

7 – 05: The term state registered engineer refers to California registered engineers only, in accordance with Division 3, section 6706.3 of the Business and Professions Code.

<u>Annual Maintenance Certification</u>

Comment:

Regarding Section 2637(b)(1) The term "Person" in this section is a problem due to definition of the term. The individual that we want to ensure has the <u>training</u> is the hands-on technician not the owner of the company for whom the technician works. Suggestion: separate sections (B) and (C) from (A) into a sub section that addresses training of the hands-on folks. 7 - 06

Change Section 2637(b)(2) to read:

> **<u>"All</u>** monitoring equipment certification<u>s</u> shall be made on a "Monitoring System Certification" form (see Appendix VI)." 7 - 07

Response:

7 – 06: We agree with this comment.

7 – 07: Same comments as 3 – 07.

Result: Section 2637(b)(1) will be revised to require non-licensed employees that conduct UST maintenance work to be trained and certified by the equipment manufacturer.

<u>Enhanced Leak Detection</u>

Comment: Regarding Section 2640(e)(2), include a timeline for response by the Program Manager. We suggest 90 days and send a copy of the decision to the local agency to ensure knowledge of the responsibility of the owner/operator and for enforcement purposes. Therefore, change this section to read:

> "Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 60 calendar days of the date the notification was mailed. **The Program Manager shall make a decision on the request within 90 calendar days of receipt of the request. The Program Manager shall also forward a copy of the decision to the local agency."** 7 - 08

Response:

7 – 08: Same comment as 3 – 08.

Result: Same as 3 – 08.

COMMENTER 8

Under-dispenser Containment

Comment: 2630(d) Further clarification is required. The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies. For instance; regulators may develop an interpretation that requires electronic line pressure (ELP) sensors on double walled piping, because ELP could provide an earlier detection of a product piping leak than the currently required turbine sump probes. 8 - 01

2636 (h)(1)(B) Text refinement required. We believe the text should read: "By July 1, 2001, for systems installed after July 1, 1987 that are located within 1000 ft of a public drinking water well, as **correctly** identified and **confirmed** pursuant to the state Geographic Information System mapping database." The text should also reference section 2640(e)(2)&(3) which allows for correction of either distance to a public drinking water well or the existence of single walled components, within 60 calendar days of the initial notification. 8 - 02

Response:

8 – 01: The language to subdivision 2630(d) states that monitoring equipment shall be "..installed and maintained such that the equipment is capable of detecting a leak at the earliest possible opportunity." This means that the monitoring equipment that has been approved by the local agency, via the approval of the monitoring and response plan, must be installed in such a manner that it detects a leak at the earliest possible opportunity in accordance with the performance characteristics of the equipment. For example, a sump probe must be installed at the bottom of the sump and not raised up several inches to avoid triggering the alarm in response to small leaks. Local agencies report that such "tampering" with monitoring probes is not uncommon.

This is not a new requirement, it is a clarification, or rephrasing, of the general requirement in subdivision 2631(g) that underground storage tanks with secondary containment shall be designed and installed so that **any** loss of a hazardous substance from the primary containment will be detected by an interstitial monitoring device or method.

8 - 02: A "correct" identification of a facility pursuant to the GIS database is implicit in the regulation and does not need to be specified. Regarding the appeals process, there is no need to reference section 2640(e) because UST facilities that do not have under-dispenser containment and are located within 1000 feet of a public well are also subject to enhanced leak detection requirements pursuant to subdivision 2640(e) and section 2644.1. This is because the absence of UDC means that the facility has a single-walled component. However, if the lack of UDC constitutes the only single-walled component, then the facility will not be subject to enhanced leak detection after the UDC is installed.

Furthermore. if the lack of UDC constitutes the only single-walled component, the SWRCB will not be directly notifying the facility regarding enhanced leak detection or UDC requirements since the necessary facility information (i.e the absence of UDC) is not in the GIS database. As an alternative, the SWRCB will be sending a fact sheet to all UST facility owners or operators informing them of the upcoming regulatory requirements and providing them with information on how to determine if their facility is within 1000 ft of a public well. It will then be up to the owner or operator of a facility that does not have under-dispenser containment to make this determination, in coordination with the local agency, and comply with the applicable under-dispenser containment installation deadline.

Result: No changes.

Secondary Containment Testing

Comment: 2637(2). For most pieces of equipment, the manufacturer will have test criteria for post installation testing. Whether the criteria is "no less stringent then those used at installation" has not been determined by the equipment manufacturer. For tanks, the installation testing criteria might be an air test with soapy foam above ground. This type of test would not be practical once the tank is buried. If a piece of equipment has a testing criteria established by its equipment manufacturer, this testing criteria is the standard. To test beyond the manufacturer's criteria may void the manufacturers warranty. 8 - 03

Response:

8 – 03: Same comment as 1 - 01

Result: No changes.

Enhanced Leak Detection

Comment:2644.1(a)(2) We are opposed to reducing the leak detection standard to .005 gph, one-tenth of what the current regulations require. We understand that a high degree of false positives may be encountered with this lower detection limit. Even a 5% false alarm rate will be very costly when considering the fact that UST systems may be mistakenly excavated to address "apparent" UST system leaks. 8 - 04

In addition, the State should confirm that any proposed monitoring standard is achievable by more than one company. We are concerned that these low standards will create a monopoly for the Tracer Tight Technology. 8 – 05

Response:

8 – 04: Regarding false positives, the proposed method for enhanced leak detection was chosen because, among other reasons, it was capable of being third-party certified to a leak rate sensitivity of 0.05 gph, and recently has been third-party certified to a leak rate sensitivity of 0.005 gph, both tests conducted at the 95/5 reliability standard. The 95/5 reliability standard is the same standard that is used for all other UST monitoring, and as such, the assertion that this method has a "high degree" of false positives is misleading, since there will not be any more false positives than any other third-party approved monitoring method. And so it follows that there will also not be any greater potential for "mistaken" excavations.

8 – 05: Same comment as 45-day LS20 – 01, and LS21 – 09.

Result: No changes.

<u>Annual Maintenance Certification</u>

Comment: Appendix VI - I don't see when the UST Monitoring Plot Plan would be used since all sites must have monitoring and hazardous material management plans (HMMPs) Existing monitoring and HMMP requirements should satisfy this portion of the proposed regulation. 8 - 06

Response:

8 – 06: Appendix VI is the annual monitoring maintenance certification form and consists of two parts 1) a checklist for ensuring that all of the site monitoring equipment is properly inspected, and 2) a monitoring site plan sheet for the inspector to draw the locations of the monitoring equipment that has been inspected. The annual monitoring maintenance inspection form is a separate document from the Monitoring Plot Plan, which is required as part of the permitting process.

Result: No changes.

COMMENTER 9

Under-dispenser Containment

It may be helpful, to reword the term "Dispenser spill containment or control system" in order to enhance the distinction between it and "Under-dispenser containment". As one possibility, changing to "Under-dispenser spill control system" would place the two definitions next to each other in the list, thus, making a distinction readily apparent. Further, the definition might be expanded to include the words "... a device, which is not Under-dispenser containment, that is capable ...". (Note: Wording at section 2636(h) would also have to be reworked for consistency.) 9 - 01

2630(a). It might be helpful, for the sake of improved clarity, to either include a specific effective date, or, to reference the definitions of new UST and/or existing USTs (i.e., "... owners of new underground storage tanks (as defined in Section 2611)". 9 - 02

2636(f). It would seem to be necessary to specify that the requirements for monitoring also apply to dispensers equipped with the alternative spill containment/control system. 9 - 03

2636(g)(4). There appear to be practical problems with the requirement that the "pumping system shuts down automatically if ***any*** of the continuous monitoring systems for the piping fail or are disconnected". For example:

- Lack of clarity. Because the term has not been defined, "pumping system" could be interpreted to mean the turbine pump in the UST, an affected fuel dispenser, all fuel dispensers for a particular product, or even the entire site. Further, the language specifies that pumping is to be shut down in the event that any monitoring system fails. We believe that remedial action should focus on the problem location, and respectfully suggest that the language be changed to make this clearer. Lastly, it should be noted that in the rare event of a UST leak, it is beneficial to continue – not cease – the dispensing of gasoline because it contributes to a lowering of the product level in the tank. 9 - 04

- Equipment capabilities. Although the goal of this requirement is noteworthy, we are not aware of any currently-available system which can detect the failure of a component or tampering. If this goal is to be met, adequate time must be allowed for system development and for conversion/upgrading of existing systems. We believe that this issue should be a topic for further discussion rather than being required at this time. 9 - 05

2660(h). These regulations do not require the "upgrading" of the actual dispensers, per se. Thus, in order to avoid any confusion, it would be appropriate to change the second sentence to read as follows: "Requirements for under-dispenser containment, or under-dispenser spill control systems, shall be completed no later than December 31, 2003." 9 - 12

Response:

9 – 01: We agree with this comment.

9 – 02: Not a comment on the proposed regulations.

9 – 03: We agree with this comment.

9 – 04: The regulatory language that is the subject of the comments is not part of the proposed regulations.

9 – 05: The regulatory language that is the subject of the comments is not part of the proposed regulations.

9 – 12: We agree with this comment.

Results: Section 2611 will be amended to change "Dispense spill containment and control system to "Under-dispenser containment and control system; subdivision 2636(f) will be amended to specifically include under-dispenser containment and control systems; and subdivision 2660(h) will be amended to include the recommended language.

<u>Secondary Containment Testing</u>

2637(a). Because the amendments will not be approved by OAL until after January 1, 2001, it would seem appropriate to change the effective date, from January 1, 2001, to "... six months after the date of adoption ...". 9 - 06

2637(a)(1). This section requires that existing containment systems, which cannot be tested per regulatory requirements, must be replaced. There will be cases where it should be feasible to "repair, modify, or upgrade" some types of existing systems so that they can be appropriately tested. We request that such an allowance be added. 9 - 07

2637(a)(2). The requirement that systems be "tested to test criteria no less stringent than those used at installation" is somewhat vague. In addition, there might be cases where there is a conflict with a manufacturer's post-installation testing guidelines because there may be certain options which cease to exist once the installation is complete and the facility is put into service. For example, whereas highly-sensitive vacuum testing might be used to verify the integrity of under-dispenser containment after initial installation, this type of testing cannot necessarily be performed once risers and conduits are extended up into the dispenser. We suggest that, 1) the language of the requirement be clarified, and 2) a clause be added to enable facilities to avoid any potential conflict between installation and post-installation testing, respectively. 9 - 08

Response:

9 – 06: Current UST regulations already require secondary containment testing at installation, thus in this regard the January 1, 2001 effective data is moot. With respect to the new requirement in the proposed regulations for a follow-up test six-months after installation, those UST systems installed after January 1, 2001 will **<u>not</u>** be required to conduct the six-month follow up test if the proposed regulations do not become law within six months of that particular installation. In all other cases, the six month follow up test will be required. Although this is confusing, the confusion will eventually clear up. However, including regulatory language that establishes the compliance date as six months after the date of adoption of the regulations would incorporate this confusion into the regulations. Wherever possible, a clear and definite regulatory deadline is preferable to an ambiguous deadline.

9 – 07: This is already allowed in the proposed regulations i.e. if the secondary containment system can be repaired, modified, or upgraded so that it becomes testable, this would essentially be the same as "replacing" the system such that it becomes testable.

9 - 08: Same comment as 1 – 01.

Result: No changes.

Enhanced Leak Detection

2644.1(a)(1). There is, to the best of our knowledge, only one technology which fully meets the criteria as set forth in this section. While neither WSPA, nor its member companies, have any objections to sole known provider of the technology, we submit that it is not appropriate for the state to essentially grant a monopoly. We are simply concerned about the prospects of being "married" to a sole-source supplier. Accordingly, we respectfully request that the criteria be amended to allow for a set of alternate criteria which can be demonstrated to be equally effective. 9 - 09

WSPA also believes that it is premature to mandate one unique approach to enhanced leak detection at this time. The SWRCB is currently embarking on its field-based research program using Tracer Research Corporation as the testing sub-contractor. As the study program progresses, all of the parties to the program can expect to gain significant experience with the use of Tracer Research's technology and its application to RGOs. While we are optimistic that the testing program will be successful, it is certainly conceivable that problems will be encountered. Because all of the experience from the field-based research program should be factored into a decision regarding the criteria for enhanced leak detection, we suggest that, at minimum, a technology-review step be included in the Board's adopting resolution for the amendments. 9 - 10

2644.1(a)(2). While we understand the basis for the change in leak rate detection capability to a level of 0.005 gph, the change results in facilities being "wedded" to a sole-source supplier to an even greater degree. Thus, for this reason, we oppose the change. 9 - 11

Response:

9 – 09, 9 –10, 9 – 11: Same comments as 45-day L20 – 01, L18 – 05, L21 – 09, and L21 – 10.

Results: Same.

C. SUMMARY OF, AND RESPONSE TO, COMMENTS (DEC. 22 TO JAN. 8)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

TABLE OF SWRCB RESPONSE TO COMMENTS
15-DAY COMMENT PERIOD #2 (December 22, 2000 and January 8, 2001)

COMMENTERS

	NAME
1	BP Western Region
2	Chevron
3	City of San Rafael
4	County of Orange
5	Dennis Rock
6	Tosco
7	Veeder Root
8	Western States Petroleum Association

SWRCB RESPONSES TO COMMENTS ON PROPOSED SB 989 REGULATIONS
15-DAY COMMENT PERIOD #2 (December 22, 2000 to January 8, 2001)
SORTED BY SECTION

Section / subject	Comment Number	Summary of comment	Response	Revision needed
2611 / Definitions	A4 - 01	The definition of "dispenser" needs to be clarified as to whether a day tank, connected to a backup generator, would be considered a dispenser under this definition. If it does not fit the definition, this should be addressed.	Same comment as 45-day S9 – 04.	Same.
2630 / General Applicability of Article	A6 - 06	The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies	Same comment as 15 day #1: 8 – 01.	Same
2636 / Under-dispenser containment	A3 - 01	Recommends that audible/ visual alarm and dispenser shut-off be required for systems regulated under 2636(f).	**Rejected:** We believe that requiring both an audible and visual alarm, and dispenser shut-off, is excessive regulation and contrary to past practices that have been allowed by local agencies, with concurrence from the SWRCB.	None
2636 / Under-dispenser containment	A3 - 02	Recommends additional requirements for piping/dispenser pan systems connected in a series.	**Rejected:** Not needed since current requirements amount to essentially the same thing as proposed additional requirements.	None
2636 / Under-dispenser containment	A4 - 02	Section 2636)f) should be clarified to read "Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section."	Same comment as 15-day #1: 3 – 02.	Same.
2636 / Under-dispenser containment	A4 - 03	Section 2636(f)(3) states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2). The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser.	Same comment as 15-day #1: 3 – 03.	Same

2636 / Under-dispenser	A4 - 04	Section 2636(g)(3) states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2). The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser.	Same comment as 15-day #1: 3 – 03.	Same
2636 / Under-dispenser containment	A4 - 05	Section 2637(b)(2) states that the annual certification be made on the Monitoring System Certification form. This should read "**All** monitoring equipment certification shall be made on …",	Same comment as 15-day #1: 3 - 07	Same
2636 / Under-dispenser containment	A6 - 02	Section 2636 (h)(1)(B) Text refinement required. We believe the text should read: "By July 1, 2001, for systems installed after July 1, 1987 that are located within 1000 ft of a public drinking water well, as **correctly** identified and **confirmed** pursuant to the state Geographic Information System mapping database	Same comment as 15-day #1: 8 – 02.	Same
2636 / Under-dispenser containment	A8 - 04	July 1, 2001 is the deadline for installing under-dispenser containment, at sites installed after July 1987, if the site is within 1000 feet of a public drinking water well (2636(h)(1)(B)). We suggest that a period of one year be allowed – commencing with the date of notification by the Board.	**Rejected:** The deadline for installing under-dispenser containment at facilities lacking this component and located within 1000 ft of a public drinking water well is a statutory deadline and cannot be changed by the SWRCB.	None
2637 / Annual Monitoring Certification	A6 - 05	Appendix VI - I don't see when the UST Monitoring Plot Plan would be used since all sites must have monitoring and hazardous material management plans (HMMPs) Existing monitoring and HMMP requirements should satisfy this portion of the proposed regulation	Same comment as 15-day #1: 8 – 06.	Same
2637 / Annual Monitoring Certification	A7 - 01	We see no value in the removal and functional testing of in-tank probes that have consistently provided accurate inventory and leak detection results.	**Rejected:** Functional testing of monitoring equipment is important to ensure that the equipment is performing as designed. Debris, water, tampering etc. may render probes non-functional without any immediate indication.	None

2637 / Secondary Containment Testing	A1 - 01	We are concerned that while secondary containment testing needs to begin immediately, the regulations have not yet been formally adopted.	**Rejected:** Secondary containment tests conducted after January 1, 2001 performed according to proposed regulations will comply. Local agencies are ready to receive notifications for these tests. There is no barrier to owners or operators against proceeding the secondary containment testing.	None
2637 / Secondary Containment Testing	A1 - 02	We ask for an extension of the deadline for testing of secondary containment systems for at least one additional year. As an alternative, we recommend a requirement for multi-site operators to test a third of their stations beginning this year.	**Accepted:** We agree with the request to extend the deadline for the initial secondary containment test for systems installed prior to January 1, 2001	Revise 2636(a) to allow additional year for initial test
2637 / Secondary Containment Testing	A2 - 01	Since the amended regulations will not be approved by OAL until at least March or April 2001, it would seem appropriate to change the effective date to "… six months after the date of adoption for secondary containment systems installed on or after January 1, 2001	Same comment as 15-day #1: 9 – 06.	Same
2637 / Secondary Containment Testing	A2 - 02	The January 1, 2002, date for testing existing secondary containment (including under dispenser containment) is unfair Therefore, we suggest the testing deadline be extended to December 31, 2003.	Same comment as A1 - 02	Same
2637 / Secondary Containment Testing	A2 - 03	The proposed deadlines associated with 2637(a)(1) would also need to be re-evaluated and appropriately adjusted to be consistent with any revision to the deadline date for testing secondary containment systems 2637(a).	None	None.
2637 / Secondary Containment Testing	A2 - 04	It is unclear as to what the consequences are for failing a secondary containment test and what actions need to be taken.	**Answer:** The consequences of failing a secondary containment test are the same for failure of any test conducted on UST components	None.
2637 / Secondary Containment Testing	A5 - 01	Section 2637(a)(3), still includes tank testers as being eligible to test secondary containment. If they are a licensed tank tester and they do not possess a contractors license of the types listed in 2637 (b) (1) they are not qualified to test secondary containment or perform any other work on a tank system.	**Rejected:** Licensed tank testers are qualified to conduct the test, but not any significant repair work need to update the system to allow for the test.	None

2637 / Secondary Containment Testing	A6 - 01	Section 2637(2) For most pieces of equipment, the manufacturer will have test criteria for post installation testing. Whether the criteria is "no less stringent then those used at installation" has not been determined by the equipment manufacturer.	Same comment as 15-day #1 1 – 01.	Same
2637 / Secondary Containment Testing	A8 - 01	2637(a). Because the amendments will not be approved by OAL until after January 1, 2001, it would seem appropriate to change the effective date, from January 1, 2001, to "... six months after the date of adoption ...".	Same comment as 15-day #1 9 – 06.	Same
2637 / Secondary Containment Testing	A8 - 02	We request that, consideration be given to allowing owners of a large number of sites to test approximately one-third of them each year, with completion of the first full three-year cycle required by December 31, 2003 (a date which is consistent with the requirement for installation of secondary containment in Section 2666(e)).	Same comment as A1 – 02.	Same
2637 / Secondary Containment Testing	A8 - 03	The proposed deadlines associated with other requirements (such as those in Section 2637(a)(1), for replacing secondary containment systems which cannot be tested, submitting an alternate workplan and conducting enhanced leak detection) should also be re-evaluated from the perspective of reasonableness and consistency with the balance of the requirements	**Answer:** The deadlines associated with secondary containment systems that currently cannot be tested have been carefully evaluated in consideration of all related comments	None
2644.1 / Enhanced Leak Detection	A6 - 03	Section 2644.1(a)(2) We are opposed to reducing the leak detection standard to .005 gph, one-tenth of what the current regulations require. We understand that a high degree of false positives may be encountered with this lower detection limit	Same comment as 15-day #1 8 – 04.	Same
2644.1 / Enhanced leak Detection	A6 - 04	With respect to enhanced leak detection, the State should confirm that any proposed monitoring standard is achievable by more than one company	Same comment as 45-day L20 – 01.	Same

General Comment	A5 – 02	How is it that the owner of the tank has to fulfill financial responsibility requirements in favor of the people of California yet under SB 989 the guy who might blow up a tank during a test, while there is product in the tank, doesn't have to provide anything to anybody?	**Rejected:** Not a comment on the regulations.	None

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #2
(Comments submitted between December 22, 2000 and January 8, 2001)

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments.

	NAME	DATE
1	**BP Western Region**	**January 8, 2001**
2	**Chevron**	**January 8, 2001**
3	**City of San Rafael**	**January 8, 2001**
4	**County of Orange**	**January 4, 2001**
5	**Dennis Rock**	**January 8, 2001**
6	**Tosco**	**January 8, 2001**
7	**Veeder Root**	**January 8, 2001**
8	**Western States Petroleum Association**	**January 8, 2001**

COMMENTER 1

Secondary Containment Testing

Comment: This communication focuses on our concerns regarding the implementation of the proposed addition of Section 2637(a) to Title 23, Division 3, Chapter 16, Article 3, paragraph 2, requiring that all existing secondary containment systems are tested by January 1, 2002. Due to our large number of sites, we must begin this testing immediately at a rate of 4 sites per business day in order to comply with the deadline.

We are concerned that while testing needs to begin immediately, the regulations have not yet been formally adopted. Therefore, we must ask a few questions relating to the practical implementation of the testing requirement, such as (1) Will a test that is performed prior to the formal adoption of the regulations actually qualify as a compliant test? (2) Are local agencies ready to receive testing notifications? (3) Is there any barrier to us proceeding with testing right now? A1 - 01

In light of the above concerns with the timing of the requirement, we respectfully ask for you consideration in extending the deadline for testing of secondary containment systems for at least one additional year. As an alternative, we recommend that you also consider a requirement for multi-site A1 - 02 operators to test a third of their stations beginning this year, to be completed by the end of 2003. Under this scenario, a three-year clock would begin upon each sites testing completion. This alternating triennial testing schedule would avoid the inevitable rush leading to a universal deadline.

Response:

A1 – 01: Any secondary containment test conducted after January 1, 2001 that is performed in accordance with the proposed regulations will comply with those regulations, and local agencies are ready to receive notifications for these tests. There is no barrier to owners or operators against proceeding the secondary containment testing.

A1 – 02: We agree with the request to extend the deadline for the initial secondary containment test for systems installed prior to January 1, 2001, however, we disagree with the proposed alternative. Although we understand the intent of a sequenced requirement for secondary containment testing to avoid the last minute rush, regulatory language requiring that compliance be done in "thirds" would be nearly impossible to enforce, and would probably not meet the Administrative Procedures Act "clarity" standard for regulations.

Result: Subdivision 2637(a) will be revised to allow an additional year for testing of secondary containment systems installed prior to January 1, 2001.

COMMENTER 2

Secondary Containment Testing

Comment: Chevron appreciates the opportunity to comment on the proposed amendments to the UST regulations. We have no real comments on the most recent proposed changes (December 22, 2000 draft). However, in further review of the entire proposed amendments we have several areas of concern, which are detailed below:

- 2637 (a): "*Secondary containment systems installed on or after January 1, 2001 shall be tested upon installation, 6 months after installation, and every 36 months thereafter*". Since the amended regulations will not be approved by OAL until at least March or April 2001, it is unclear as to the enforceability of this January 1, 2001 date. A2 - 01
  - It would seem appropriate to change the effective date to "*... six months after the date of adoption*".
- 2637 (a): "*Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002 and every 36 months thereafter*". Our interpretation of the proposed regulations is that the majority of Chevron sites would be required to be tested because they are secondarily contained and do not appear to meet the testing exemption criteria. Therefore we believe that it will be impossible for the entire industry to meet this deadline because there are not enough certified testing contractors available to conduct the testing by this date. In addition, we believe that this short deadline for testing existing secondary containment A2 - 02

actually penalizes those companies who have been proactive in protecting the environment by voluntarily installing dispenser containment. The January 1, 2002, date for testing existing secondary containment (including under dispenser containment) is unfair when the proposed regulations allow up to December 31, 2003 to install under dispenser containment. This effectively places a higher burden and more costs on those companies who have already installed dispenser containment by requiring them to test the equipment before other companies are required to even install dispenser containment. Therefore, the following language is suggested:

- *"Secondary containment systems installed prior to January 1, 2001 shall be tested by December 31, 2003 and every 36 months thereafter".*

- The proposed deadlines associated with 2637(a)(1) would also need to be re-evaluated and appropriately adjusted to be consistent with any revision to the deadline date for testing secondary containment systems 2637(a). A2 - 03

- Lastly, it is unclear as to what the consequences are for failing a secondary containment test and what actions need to be taken. We want to make sure that any requirements take into consideration that there is no confirmed release of product since the primary containment is tight. A2 - 04

Response:

A2 – 01: Same comment as 15-day 9 – 06.

A2 – 02: Same comment as A1 -

A2 – 03: We agree the deadline for secondary containment testing of systems installed prior to January 1, 2001 should be extended.

A2 – 04: The consequences of failing a secondary containment test are the same for failure of any test conducted on UST components – i.e. the component will need to be repaired such that it can then pass the test. We agree that failure of a secondary containment test does not necessarily indicate a potential release into the environment unless the primary containment has also failed.

Result: See Commenter 1.

COMMENTER 3

<u>Under-dispenser Containment</u>

Comment: We recommend making the following changes to section 2636(f) and (g):

(f)(1) "All the secondary containment, including under-dispenser containment and under-dispenser spill control or containment systems, shall be equipped with a continuous monitoring system that ~~either~~ activates an audible and visual alarm ~~or~~ and stops the flow of product ~~at~~ from the dispenser when it detects a leak."

Reasoning: We are finding in the field that alarms are consistently being ignored and or reset (silenced). Stopping the flow altogether is the most effective intent of this regulation. Allowing the system to just sound an alarm is inviting and providing operators/workers an easy way to circumvent the law.

(f)(3) "Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the method otherwise required by this section. Continuous monitoring systems as described in subdivision (1), which ~~shut down~~ stops the flow of product to the dispenser ~~pump~~ in addition to ~~either~~ activating the audible and visual alarm ~~or stopping the flow of product at the dispenser~~ satisfy the automatic line leak detector requirement of subdivision (2)." A3 - 01

Reasoning: Again, alarms are being ignored. If we are going to allow a relaxation of a GPH leak detection requirement (subsection 2) we must have the most capable detection and correction abilities in place. Removing "or stopping the flow of product at the dispenser" because it says the same thing as the previous sentence which states the system should "stop the flow of product……"

(g)(1) "All secondary containment systems are equipped with continuous monitoring systems that will stop the flow of product from the dispenser and sound an audible and visual alarm at a continuously monitored location. The leak detection device may be located at the pump sump for sections of the piping that slope back to this point, or;
If pressure piping is run in series between dispensers, and grading problems prohibit some sections of piping between dispensers to drain to the pump sump for monitoring, the under-dispenser pans of the effected dispensers may be equipped with a sensor that will stop the flow of product from all dispensers and sound an audible and visual alarm at a continuously monitored location." A3 - 02

Reasoning: The minimum reaction of the continuous monitoring system should be stated. The reaction is consistent with the recommendation of both a product stoppage and an audible alarm as seen above.

We find in the field especially with a series run of piping that sometimes between the dispensers slope to the pump sump becomes difficult.

Response:

A3 – 01: California underground storage tank construction and monitoring regulations represent minimum state requirements that the SWRCB believes adequately implement related statutes and cost-effectively protect groundwater from leaking fuel tanks. These requirements assume that mandated equipment is installed and maintained properly. No technology can overcome deficiencies in these two areas and still perform as required.

We believe that requiring both an audible and visual alarm, and dispenser shut-off, is excessive regulation and contrary to past practices that have been allowed by local agencies, with concurrence from the SWRCB, for years (see Commenter 2). Additionally, Health and Safety Code subsection 25291(a)(6), which provides the statutory authority for under-dispenser monitoring, only requires that secondary containment be equipped with an alarm to indicate a leak. Requiring both an audible and visual alarm, and, dispenser shut-off, would likely exceed this authority.

A3 – 02: In order to meet the requirements of 2636(g) **all** secondary containment monitoring systems for piping (which includes under-dispenser piping) must be continuous (2636(g)(1); must be connected to the pumping system (2636)g)(2); and must shut down the pump **and** either activate and audible and visual alarm or stop the flow of product at the dispenser. Therefore, even if pressure piping is run in a series between dispensers, each dispenser will need to have a sensor that shuts down the pump when a release is detected. As such, there is no need for fuel released into the piping secondary containment to flow all the way back to the pump sump in or to trigger pump shutdown, it only needs to flow into one of the dispenser pans. However, all piping systems, series or not, must be adequately sloped back to the pump sump and should be repaired if the grade has changed such that the slope has become less than the minimum required for the installation.

Result: No changes.

COMMENTER 4

Under-dispenser Containment

Comment: Section 2611 provides a new definition for "Dispenser". The last sentence states: "Dispenser includes metering and delivery devices, and fabricated assemblies located therein". A4 - 01

The definition needs to be clarified as to whether a day tank, connected to a backup generator, would be considered a dispenser under this definition. If it does not fit the definition, this should be addressed.

Section 2636(f) is meant to define additional requirements for dispenser containment systems without audible visual sensors (i.e. mechanical floats). Dispenser containment without audible visual sensors would be required to comply with 2636(f)(1) through (4) of this section.

It is our opinion that this section is meant to give a choice between 2636(f)(2) **or** (3). It should be clarified to read "Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section." A4 - 02

Section 2636(f)(3) states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the A4 - 03 flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2).

The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline.

Section 2636(g)(3) states: "All continuous monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **at** the dispenser when they detect a leak". A4 - 04

The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline.

Response:

A4 – 01: Same comment as 45-day S9 – 04.

A4 – 02: Same comment as 15-day 3 – 02.

A4 – 03: Same comment as 15-day 3 – 03.

A4 – 04: Same comment as 3 – 03.

Result: None

<u>**Annual Maintenance Certification**</u>

Comment: Section 2637(b)(2) states that the annual monitoring certification shall be made on the Monitoring System Certification form.

Many times a monitoring system may be repaired, reprogrammed or reinstalled during the year. A4 - 05
It is our opinion that this section should read "**All** monitoring equipment certification shall be made on …", instead of only "Annual monitoring equipment certification shall be made on…".

Response: Same comment as 15-day 3 – 07.

Result: Same.

COMMENTER 5

Secondary Containment Testing

Comment: 2637(a) 3, still includes tank testers as being eligible to test secondary containment. If they are a licensed tank tester and they do not possess a contractors license of the types listed in 2637 (b) (1) they are not qualified to test secondary containment or perform any other work on a tank system. There is also the question of maintaining the proper insurance to protect the client and the environment. All they are licensed to do is test the primary tank integrity.

By definition of H & SC 6.7 as amended 01-01-97, Section 25281(y) "Underground tank System" includes connected piping and containment systems. By definition of the Business and Professions Code and the CSLB regulations, to provide work on a tank system other than tank testing you must have the proper contractors license. To a large extent, the major problems for the underground storage tank program have occurred because unqualified persons have been allowed to work on tank systems and remediation projects. A5 - 01

The testing of secondary containment is going to involve the disassembly and reassembly of various piping components and electronic monitoring system components within the tank system. Both at the dispenser island and at the tank. Tank testers are not trained to accomplish this type of work nor are they trained to provide the type of testing that will be required. In conversations with tank manufacturers it is also apparent that they are not happy with this inclusion. It is my belief that tank testers be removed from 2637 (a) 3 as qualified persons.

Response:

A5 – 01: The SWRCB included licensed tank testers in the qualification requirements for secondary containment testing because the SWRCB believes that the content of the tank tester license exam equally (or better) qualifies persons to conduct secondary containment testing as do the exams for listed contractors licenses in 2637(a). However, we agree that secondary containment testing will, in many cases, involve disassembly and re-assembly of various piping components and electronic monitoring system components within the tank system.

In accordance with CSLB regulations, a contractors license is required for tank installation, improvement, or removal if the aggregate costs of such work exceeds $300. Additionally, in accordance with the SWRCB proposed regulations, UST system maintenance and repairs must be conducted by a licensed contractor or an employee of a licensed contractor. Therefore, a tank tester that does not have a contractor's license may only conduct the actual secondary containment test and any preparatory work that does not come under the category of UST improvement (costing more than $300) or repair.

Result: No changes.

Other Comments

Comment: On a side bar note, how is it that the owner of the tank has to fulfill financial responsibility requirements in favor of the people of California yet under SB 989 the guy who A5 - 02 might blow up a tank during a test, while there is product in the tank, doesn't have to provide anything to anybody? A vacuum test is still the best way to go regardless of what all the local agency experts say.

Response:

A5 – 02: Not a comment on the regulations.

Result: No changes.

COMMENTER 6

Secondary Containment Testing

Comment: 2637(2) For most pieces of equipment, the manufacturer will have test criteria for post installation testing. Whether the criteria is "no less stringent then those used at installation" has not been determined by the equipment manufacturer. For tanks, the installation testing criteria might be an air test with soapy foam above ground. This type of test would not be practical once the tank is buried. If a piece of equipment has a testing criteria established by its equipment manufacturer, this testing criteria is the standard. To test beyond the manufacturer's criteria may void the manufacturers warranty. A6 - 01

Response:

A6 – 01: Same comment as 15-day 1 – 01.

Result: No changes.

Under-Dispenser Containment

Comment: 2636 (h)(1)(B) Text refinement required. We believe the text should read: "By July 1, 2001, for systems installed after July 1, 1987 that are located within 1000 ft of a public drinking water well, as **correctly** identified and **confirmed** pursuant to the state Geographic Information System mapping database." The text should also reference section 2640(e)(2)&(3) which allows for correction of either distance to a public drinking water well or the existence of single walled components, within 60 calendar days of the initial notification. A6 - 02

Response:

A6 – 02: Same comment as 15-day 8 – 02.

Result: No changes.

Enhanced Leak Detection

Comment: 2644.1(a)(2) We are opposed to reducing the leak detection standard to .005 gph, one-tenth of what the current regulations require. We understand that a high degree of false positives may be encountered with this lower detection limit. Even a 5% false alarm rate will be very costly when considering the fact that UST systems may be mistakenly excavated to address "apparent" UST system leaks. A6 - 03

In addition, the State should confirm that any proposed monitoring standard is achievable by more than one company. We are concerned that these low standards will create a monopoly for the Tracer Tight Technology. A6 - 04

Response:

A6 – 03: Same comment as 15-day 8 – 04.

A6 – 04: Same comment as 45-day L20-01

Result: No changes.

Annual Maintenance Certification

Comment: Appendix VI - I don't see when the UST Monitoring Plot Plan would be used since all sites must have monitoring and hazardous material management plans (HMMPs) Existing monitoring and HMMP requirements should satisfy this portion of the proposed regulation. A6 - 05

Response:

A6 – 05: Same comment as 8 – 06.

Result: No changes.

Other Comments

Comment: 2630(d) Further clarification is required. The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies. For instance; regulators may develop an interpretation that requires electronic line pressure (ELP) sensors on double walled piping, because ELP could provide an earlier detection of a product piping leak than the currently required turbine sump probes. A6 - 06

Response:

A6 – 06: Same comment as 8 – 01.

Result: No changes.

COMMENTER 7

Our published recommendations as a manufacturer are intended to facilitate the inspection of our equipment in a safe and effective manner. We have concerns regarding the requirements to perform in-field functional testing according to the "Monitoring System Certification" draft presented in the amendments to Chapter 16 of SB 989.

Based on the design of systems and the actual experience of managing sites, we believe that regular evaluation of tank and line leak test results, combined with proactive follow-up on sites that do not achieve regular results, are highly effective means of confirming release detection performance and minimizing the time between releases and their detection.

On-site inspections that include an evaluation of regular monthly documentation help enforce regular evaluation of results, and are detecting many problems such as non-functioning or disabled equipment and failure to maintain leak detection records. These problems would have been detected by a program of regular review of tank and line test results, and follow-up on tanks that do not achieve results.

Of course Veeder-Root will develop the necessary hardware, instructions, and training materials to support of any regulations enacted that require field functional testing. A7 - 01

We feel that the following issues exist when requiring field evaluations or functional testing of in-tank gauging and liquid sensing equipment:

Test Procedure: Veeder-Root sees no value in the removal and functional testing of in-tank probes that have consistently provided accurate inventory and leak detection results.

Coordination: Many electronic systems are remotely monitored by the customer or a designated third party. The removal of the in-tank probe or liquid sensors will produce an alarm, which will initiate a response by the monitoring center. Co-ordination with the partie(s) providing remote monitoring will be required. Documentation of the alarm closures will need to reflect the inspection process.

Safety: Removal of in-tank probes and/or sensors is often complicated in that the probes are unwieldy and easily damaged. As an example sensors installed into the narrow interstice of a double wall tank are often installed before the tank is filled, as the tank can deform and compress the interstitial space when completely full. If an inspection of a double wall tank sensor on a fiberglass tank occurs when the tank is completely full, it may difficult but possible to remove the sensor for inspection by pulling on the installation cord. But it may be quite impossible to push the sensor back into proper position after the inspection, at least until the tank is partially emptied.

System Operation: The removal of in-tank probes and sensors will cause alarms that must be reset. Since these alarms resulted from the testing procedure itself the alarm history should be cleared to avoid confusion. This modification of the systems memory will also clear actual alarms that occurred. Technicians will need specific post-test procedures for each model tested.

We feel that the following issues exist when requiring field evaluations or functional testing of electronic line leak detection equipment:

Test Procedure: The operation of electronic systems varies by manufacturer and model. A test procedure for each model will be required.

Coordination: Many electronic systems are remotely monitored by the customer or a designated third party. The quantitative test by definition produces an alarm, which will initiate a response by the monitoring center. Co-ordination with the partie(s) providing remote monitoring will be required. Documentation of the alarms related to inspection processes will need to be documented.

Safety: Quantitative testing requires unrestricted product flow through an orifice into a container, during which the submersible pump must remain on. Electronic systems control submersible pump operation, and routinely turn the pump on at various intervals to perform leak detection functions. These intervals may change depending on the site configuration such as type and length of piping. Clear procedures are required to ensure that the pump, which must be on to enable the test, cannot run while the test apparatus is being installed or when the container is not safely in place.

System Operation: Upon detecting the induced leak, the electronic system will disable the submersible pump. Different models have varied procedures for confirming a no-leak condition, and returning the pump to proper operation. Technicians will need specific post-test procedures for each model tested.

The checklist refers to inducing precision (0.1 and 0.2 gph) line leak tests to verify proper operation of the electronic line leak device. In-field functional testing at precision thresholds is impractical. Precision level tests can run several hours causing significant down time for the retail marketer. We specifically recommend that the section G, first checklist item, be modified to eliminate the need for precision testing on an annual equipment certification basis.

Once again, Veeder-Root will work closely and cooperate with the SWRCB as regulations are put into effect. Additionally we will support formulation of test procedures as called for by California regulations.

Response:

A7 – 01: Functional testing of monitoring equipment is important to ensure that the equipment is performing as designed. Debris, water, tampering etc. may render probes non-functional without any immediate indication. State Water Board and local agency staff have witnessed this during field inspections at several UST facilities. We realize that specialized training and procedures are necessary to functionally test monitoring equipment, which is one of the reasons for the new requirements for training and certification by the manufacturer of the equipment being tested.

Regarding the testing of line leak detectors by simulating leaks, only the 3 gph test is required. The precision leak rates (0.1, and 0.2 gph) are only listed in order for the technician to indicate whether or not the precision tests were conducted.

Result: No changes.

COMMENTER 8

Secondary Containment Testing

Comment: The proposed addition of Section 2637(a) to Title 23, Division 3, Chapter 16, Article 3, was the subject of a previous WSPA comment. However, in retrospect, we believe that our earlier comment may not have been sufficiently clear or complete. Therefore, we would respectfully request that consideration be given to the following expanded comment (the original comment, from our letter of December 11, 2000, is in italics): A8 - 01

> 2637(a). *Because the amendments will not be approved by OAL until after January 1, 2001, it would seem appropriate to change the effective date, from January 1, 2001, to "... six months after the date of adoption ...".* This comment reflects our concern with retroactive applicability to systems which will have been installed prior to the legally effective date of the amendments.

However, we are also concerned with the second part of the paragraph which requires that all "grandfathered" systems be tested no later than January 1, 2002. Our concern stems from the fact that, since these requirements will not be legally binding until after OAL review, there will be less time – perhaps significantly less time – for owner/operators to test their systems and still meet the January 2002 deadline. Even the one year period initially contemplated may be insufficient for owners having a large number of sites; we believe that there are simply not enough testing contractors. Accordingly, we request that, consideration be given to allowing owners of a large number of sites to test approximately one-third of them each year, with completion of the first full three-year cycle required by December 31, 2003 (a date which is consistent with the requirement for installation of secondary containment in Section 2666(e)). A8 - 02

The proposed deadlines associated with other requirements (such as those in Section 2637(a)(1), for replacing secondary containment systems which cannot be tested, submitting an alternate workplan and conducting enhanced leak detection) should also be re-evaluated from the perspective of reasonableness and consistency with the balance of the requirements. A8 - 03

Response:

A8 – 01: Same comment as 15-day 9 – 06.

A8 – 02: Same comment as 15-day A1 – 02.

A8 – 03: The deadlines associated with secondary containment systems that currently cannot be tested have been carefully evaluated in consideration of all related comments.

Result: No changes.

Under-dispenser Containment

Comment: July 1, 2001 is the deadline for installing under-dispenser containment, at sites installed after July 1987, if the site is within 1000 feet of a public drinking water well (2636(h)(1)(B)). It is WSPA's understanding that the Board's notification process is not complete. Therefore, it does not seem realistic to expect a site to take action, which is supposed to be based on notification from the State Board, and to complete that action by the rapidly approaching date of July 1, 2001. Accordingly, we suggest that a period of one year be allowed – commencing with the date of notification by the Board. A8 - 04

Response:

A8 – 04: The deadline for installing under-dispenser containment at facilities lacking this component and located within 1000 ft of a public drinking water well is a statutory deadline and cannot be changed by the SWRCB. Additionally, the SWRCB will not be directly notifying these facilities regarding UDC requirements. This is because the necessary facility information (i.e the absence of UDC) is not in the GIS database. As an alternative, the SWRCB will be sending a fact sheet to all UST facility owners or operators informing them of the upcoming regulatory requirements and providing them with information on how to determine if their facility is within 1000 ft of a public well. It will then be up to the owner or operator of a facility that does not have under-dispenser containment to make this determination, in coordination with the local agency, and comply with the applicable under-dispenser containment installation deadline.

Result: No changes.

D. SUMMARY OF, AND RESPONSE TO, COMMENTS (JAN. 9 TO JAN. 26)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

TABLE OF SWRCB RESPONSE TO COMMENTS
15-DAY COMMENT PERIOD #2 (January 9 to January 26, 2001)

	NAME
1	Chevron
2	Fiberglass Tank Institute
3	Western States Petroleum Association

Section / subject	Comment Number	Summary of comment	Response	Revision needed
2637 / Secondary Containment Testing	B1 - 01	Although, this new deadline gives tank owners an additional year to accomplish the testing, we still believe that this deadline should at a minimum be extended to December 31, 2003, for the following reasons.	The SWRCB has already extended the deadline for initial secondary containment testing of systems installed prior to January 1, 2001. We believe this additional time is sufficient for industry to work through the potential problems of this testing	None
2637 / Secondary Containment Testing	B1 - 02	We continue to be concerned that these regulations include ongoing testing of secondary containment related to most double wall tanks and piping.	The requirement for secondary containment testing was mandated by SB 989.	None
2637 / Secondary Containment Testing	B2 - 01	Constant vacuum leak detection requires the permanent installation of an electrically operated vacuum pump and automatic vacuum sensing controls to maintain the "constant" vacuum. This approach is environmentally self-defeating in today's limited electrical energy environment. We recommend deleting "or are under constant vacuum".	The SWRCB has no authority to regulate UST monitoring devices with respect to energy usage.	None
2637 / Secondary Containment Testing	B3 - 01	We believe that it would be appropriate to make the timing requirements for initial testing approximately the same as the requirements for recurring testing – that is, a three-year cycle. Thus, a most reasonable deadline for conducting initial testing would be January 1, 2004.	Same comment as B1 – 01.	None

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #3
(Comments submitted between January 9 and January 26, 2001)

	NAME
1	Chevron
2	Fiberglass Tank Institute
3	Western States Petroleum Association

COMMENTER 1

Secondary Containment Testing

Comment: Chevron appreciates the opportunity to comment on the most recent (January 9, 2001) proposed amendments to the UST regulations. As indicated in my January 8, 2001 letter to you, Chevron is very concerned about the deadline for completing all secondary containment testing. We appreciate that you moved the deadline from January 1, 2002 to January 1, 2003. Although, this new deadline gives tank owners an additional year to accomplish the testing, we still believe that this deadline should at a minimum be extended to December 31, 2003, for the following reasons:

- Almost every UST facility will be conducting some type of secondary containment testing ranging from only dispenser pans to complete site testing, including double wall tanks, double wall piping, dispenser pans and turbine sumps. Most of this equipment has not been tested since initial installation, and some new testing protocols will be in use. It is reasonable to believe that the first round of testing may not go smoothly. B1 - 01

- UST owners/operators will be utilizing the same testing contractor and agency limited resources during testing. Increasing the time frame to conduct the initial testing will increase the efficient use of existing resources and will make the 36 month follow up testing cycle easier to manage.

- The January 1, 2003 deadline requires testing of existing dispenser pans before all facilities are even required to install dispenser pans (December 31, 2003). It would seem more equitable and reasonable for these dates to be the same.

- The proposed deadlines associated with 2637(a)(1) were not changed when the testing deadline was extended to January 1, 2003. At a minimum, these deadlines should be adjusted and pushed back a year to work with the current testing deadline of January 1, 2003.

We continue to be concerned that these regulations include ongoing testing of secondary containment related to most double wall tanks and piping. Double wall tanks and piping with electronic monitoring are considered "state of the art" for underground storage systems by industry and most regulatory agencies. B1 - 02

Response:

B1 – 01: The SWRCB has already extended the deadline for initial secondary containment testing of systems installed prior to January 1, 2001. We believe this additional time is sufficient for industry to work through the potential problems of this testing. Furthermore, industry has known about the requirement for secondary containment testing for over a year given that SB 989 was signed in October 1999.

B1 – 02: The requirement for secondary containment testing was mandated by SB 989.

Result: No changes.

COMMENTER 2

Secondary Containment Systems

Comment: We appreciate the opportunity to comment on the following proposed language, namely "Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or are under constant vacuum, are exempt from periodic secondary containment testing."

Our member company experience is that constant vacuum leak detection requires the permanent installation of an electrically operated vacuum pump and automatic vacuum sensing controls to maintain the "constant" vacuum. This approach is environmentally self-defeating in today's limited electrical energy environment. We recommend deleting "or are under constant vacuum". B2 - 01

The Fiberglass Tank & Pipe Institute is a trade association that represents the manufacturers of both tanks and piping used in underground and aboveground storage and handling facilities. In terms of market share, the year 2000 Havill market study shows that some 55% of the underground petroleum tanks in service at retail and commercial fueling facilities were manufactured by our members. In addition, non-metallic underground piping prevails at fueling facilities and our members manufactured the majority of this piping.

Member company experience with vacuum leak detection:

1. Cardinal Fibreglass Industries is an Institute member and manufacturers double-wall fiberglass tanks (FRP). Attached is a page from Cardinal's brochure showing their "Vacuum Leak Detector" which is listed by Underwriters Laboratories only for application with tanks up to 3,000 gallons in size. Experience shows that the vacuum will degrade and, to maintain

a constant vacuum in the interstitial space, one needs to permanently install an electric vacuum sensor, electric vacuum pump and electric controls to run the pump and regenerate a vacuum in the interstitial space.

2. Both Containment Solutions and Xerxes Corporation are Institute members and manufacture double-wall FRP tanks up to 40,000 gallons in capacity. Often these tanks are held in inventory with a vacuum in the interstice, and the vacuum is used as a final check before shipment.

   Experience shows that vacuum will time-degrade in varying degrees depending on the size of the tank (i. e., vacuum degradation is a function of tank size; the larger the tank the more quickly vacuum will degrade). Thus, before shipping, these manufacturers recognize an allowable degradation depending on the storage time and tank size (i. e., when vacuum degradation is excessive, the tank is re-tested by the API and PEI 5-psi pressure and soaping method).

3. Institute members Containment Solutions and Xerxes have third party evaluated testing procedures, utilizing brine filled interstice, that will detect leak rates of 0.1 and 0.05 gallons per hour as required by the EPA and NFPA 329, respectively.

4. Customers often request that tank manufacturers pull a vacuum on the interstitial space before shipping to the installation job site. While experience shows that the vacuum will degrade, the time interval is short and certain AHJ officials accept limited degradation. However, it should be noted that FRP tank manufacturer installation instructions require the tank be properly tested with pressure and soap before installation, regardless of the vacuum level.

Industry experience with pressure and hydrostatic testing:

1. American Petroleum Institute recommended practices address the integrity testing of petroleum storage vessels and employ hydrostatic methods where practical. The main reason water is used in the hydrostatic test is to provide a 1.4 safety factor for this leak test (i. e., water is heavier [specific gravity of 1.0] than petroleum products [specific gravity of approximately 0.7]).

2. Institute members Containment Solutions and Xerxes Corporation recommend employing a brine solution in the interstice to provide an even greater 1.9 safety factor in the leak test (i. e., brine is heavier than water; specific gravity of 1.3). The other advantages of a brine filled interstice as a constant leak monitoring method is its low cost, low evaporation rate, freeze resistance, visual monitoring and it does not require the use of electrically operated leak detection devices.

In summary, we do not recommend that California include "constant vacuum" as a method to continuously monitor secondary containment systems. By including such a method, the state will encourage thousands of UST owners to install electrically operated vacuum pumps and controls to maintain the vacuum in double-wall tanks. This will promote the unnecessary consumption of electricity, when conservation of both water and electricity is important.

Response:

B2 – 01: The SWRCB has no authority to regulate UST monitoring devices with respect to energy usage.

Result: No changes.

COMMENTER 3

<u>**Secondary Containment Testing**</u>

Comment: Our comment letter of January 8, 2001 stated our concern with the then-current requirement in Subsection 2637(a) to complete initial testing of secondarily-contained UST systems by January 1, 2002. WSPA thanks you for proposing a one-year extension (until January 1, 2003) of the deadline for conducting initial testing. We appreciate the opportunity to comment on this proposal.

In the Detailed Statement of Reasons for the proposed time extension, reference is made to the following:

1. The actual date that the amendments will become law is April 1, 2001 at the earliest.
2. The difficulty and complexity of recurrent testing.
3. The need to carefully work through numerous issues associated with the initial test.

We concur that these issues – particularly the three taken together – are ample justification for an extension of the compliance date for the initial testing. In theory, the proposed extended date allows at least eighteen months to perform initial testing. However, although the extra year is directionally very helpful, we continue to be concerned with the logistics of conducting initial testing <u>at all affected sites</u> by the newly-proposed January 1, 2003 deadline.

WSPA-member companies tend to own large numbers of RGOs – from several hundred to over one thousand. Thus, each of these companies would have to conduct initial tests, at as many as five sites, each and every business day through the end of December 2002. This would be a significant challenge; the difficulties are these:

- Initial testing will be inherently more problematic than the recurring testing. For example, as noted in statement of reasons, there are various issues (e.g., the development of test methodologies and procedures) which need to be resolved before testing can actually begin.

- Testing of under-dispenser containment/control systems is a brand-new requirement involving equipment not previously subject to testing requirements.

- All owner/operators, including WSPA-member companies, will be competing for the same limited pool of outside resources (e.g., testing contractors, local-agencies, etc.).

- UST testing requirements will place significant additional demands on contractors, and it will take some time before these demands can be met. Many of the contractors, which RGO owner/operators would use for the additional testing of UST systems, also work on the vapor recovery systems – an area which has required a major recent increase in level of attention[1]. Other contractors have generally scaled-back their operations since the completion of the 1998 UST upgrades. Thus, we believe that virtually all contractors will need some time to staff-up in order to accommodate new UST testing requirements.

In view of these considerations, we believe that it would be appropriate to make the timing requirements for initial testing approximately the same as the requirements for recurring testing – that is, a three-year cycle. Thus, a most reasonable deadline for conducting initial testing would be January 1, 2004. We suggest this deadline because it would make for a much more manageable process while still providing environmental protection.

The deadline for installing under-dispenser containment/spill control, at sites which lack containment/control, is December 31, 2003. However, sites which already have containment/ control are currently offering a level of protection to the subsurface environment regardless of whether or not they are tested. Protection would not be lost by extending the deadline for initial testing to January 2004. B3 - 01

In order to ensure that the initial testing provides maximum environmental protection under our proposed "three-year" time-line, we would further suggest that an intermediate deadline (perhaps January 1, 2003) be set, and that all sites within 1000 feet of a public drinking water well be tested by that intermediate deadline. Owner/operators might be asked to file a testing plan with both the state and local agencies to demonstrate that they will be testing these sites first.

WSPA is seeking a manageable process for testing – particularly for the initial testing. Clearly, a more practical schedule is essential in this regard. We are also very interested in continuing to work the State Board to address the various issues which must be resolved before testing can commence.

Response:

B3 – 01: Same comment as B1 – 01.

Result: No changes.

XII. SUPPORTING DOCUMENTS / OTHER MATERIAL

A. WRITTEN, AND TRANSCRIBED, COMMENTS (45-DAY PERIOD)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
(Comments submitted between May 12 and July 18, 2000)

Comments to the proposed regulations to implement SB 989 were submitted both in writing and by oral testimony. The oral testimony was given at a public hearing conducted on July 18, 2000 in Alhambra, and documented in the transcript of proceedings (Transcript) for the hearing prepared by the court reporter. All of the written comments and oral testimony, relevant or not, are summarized below.

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments. If a commenter presented oral testimony at the public hearing the page number(s) where their respective comments can be found in the Transcript is given next to their name. Commenters with two dates identified presented written and oral testimony.

	NAME	DATE
1	Afforda Test (20 – 23):	July 18, 2000
2	Bravo Systems (12 – 14):	July 18, 2000
3	California CUPA Forum (47 – 52)	July 17, 18, 2000
4	CIOMA	July 18, 2000
5	Equiva Services LLC, SH&E Compliance	June 12, 2000
6	Environmental Working Group	July 18, 2000
7	Exxon Mobil	July 10, 2000
8	Harmon, Brian	June 9, 2000
9	L.A. County Dept. of Public Works (42 – 46)	July 18, 2000
10	Mosier Brothers Storage Tanks (15 – 16)	July 18, 2000
11	Orange County Health Care Agency	July 18, 2000
12	Pasadena Fire Department (39 - 41)	July 18, 2000
13	Pearson Equipment & Maintenance Company	July 17, 2000
14	Rock, Dennis (16 – 18)	July 18, 2000
15	Southern California Edison (36 – 38)	July 18, 2000
16	SPC (Parent to Pacific Bell et al) (55 – 56)	July 18, 2000
17	Steel Tank Institute (28 – 31)	July 11, 18, 2000
18	Time Oil Company	July 10, 2000
19	Tracer Research Corporation	July 3, 2000
20	Veeder-Root Company	July 18, 2000
21	Western State Petroleum Association (33 – 35)	July 12, 18, 2000
22	White Environmental Associates (52 – 54)	July 18, 2000

S1

MR. ROCK: So the liquid level on a hydrostatic would disappear.

MS. FARAHNAK: Yes, and the vacuum --

MR. ROCK: And the vacuum would disappear.

MS. FARAHNAK: Yeah.

MR. ROCK: Okay. A comment about 25284.1 (6)(b), where The Board is -- you're going to have the Contractor State Board, Air Pollution Patrolling Industry, all of these people get together? I notice that there is no contractor representatives involved in that.

MR. NeSMITH: That's not part of this regulation, the proposed regulation. That's in Bill 989 but none of it relates to that.

Mr. ROCK: Okay. Then, I have no further comments. Thank you very much.

MR. SILVA: Thank you, sir. Next Sandra Nimmo; Afforda Test.

MS. NIMMO: Hi, I am Sandra Nimmo from Afforda Test, and the last name is, N-i-m-m-o. And we are a testing company. We do all the testing on the tanks now, including vapor recovery, monitors, secondary containment tank lines, leak detectors if there are leaks, whatever needs to be done.

We have some confusion a little bit on this contractors' board designation. I am wondering -- we never have gotten a reason why that is being implemented. We did hear one thing that it was because

S1-01

we have some people cheating in the industry, and so this was some way to kind of reel them in or have some recourse against those companies. S1-01

I personally -- our company personally doesn't have anything against being licensed by The State as a contractor; however, the choice of licenses are so impertinent to what we do. We are constantly in classes everywhere, all over the state, out of state, having to pull men out of the field to attend classes, the expense to them is expensive.

Then to have to certify them, and take those license for something that, if it's shortening wall or pouring concrete, or something like that, it's kind of a waste of the tester's time to have to be setting this just to have a license that you can hang on the wall. I guess my question is, is there something that can be handled with The Contractors Board that maybe a license for testors could be come up with during that time, so that if we are going to take a test and study, that we can be studying this stuff that's just pertinent to us. S1-02

MR. NeSMITH: I am a little confused. You're talking about licensing pertaining to installation, monitor maintenance --

MS. NIMMO: No. The license -- having to have a contractor's license to be a tank tester.

Mr. NeSMITH: No. That's not -- the tank testing regulation is something completely different.

MS. NIMMO: Well, that's what we were told.

MR. NeSMITH: No. We are not adding any requirements to the tank tester regulations.

MS. NIMMO: So we do not have to have a contractor's license as of 2002?

MR. NeSMITH: Unless it's already incorporated in the current regulations at this time. Those regulations -- the tank tester regulations are not up for proposal today, and there is no new requirements as far as I know. What I thought you were referring to was the annual monitoring maintenance.

MS. NIMMO: That's part of your testing, yes.

MR. NeSMITH: Okay. That would be part of it as a contractor.

MS. NIMMO: And so we are going out there and checking the monitor box and putting the sensors into alarm and that kind of thing, and now we are going to have an A license or something like that?

MR. NeSMITH: You're going to have one of several licenses.

MS. NIMMO: So I guess that's the point it's --

MR. NeSMITH: I guess I was getting confused.

MS. NIMMO: That's an awful lot of learning something else just to do what we do, which is completely different. You know, what I mean? It seems like overkill to have an A license or B license. I can't find the information on the C-61 to know just exactly what that is.

MS. FARAHNAK: Chuck, actually you brought up a good point is that we have a series of licenses listed in the tanks for people who do the maintenance. One of those is a service station contractor category that has not been active. And currently we are working with State Licensing Board to make that active, and actually make it totally appropriate and relevant to what you're doing as a contractor to do -- add the certification, and I'm recording it in those efforts with every social board to include testing of a recovery system as well. So we are aware of that.

MS. NIMMO: So the C-61 it's been kind of an inactive one that they're now going to remake active and adjust it to fit the circumstances.

MS. FARAHNAK: That's our intent. That's why we are working with The State Board and Contractor State Licensing Board, are working together.

MS. NIMMO: And so that will be implemented and that will be by January 2002. That will be done, and give us time to study. S1-03

MS. FARAHNAK: I can't give guarantees, but that's our goal. And that's why we have that longer time frame.

MS. NIMMO: So we just kind of wait, and we will all be informed. And it will be per every test, or we will have to have a contractor's license rather than just a company license, regular contractor's license; is that correct? S1-04

S2

Systems.

MR. USREY: Jerry Usrey, U-s-r-e-y, with Bravo Systems. What we are looking for as a manufacture of dispenser containment since 1985, we have had a float trip mechanism that has been used as a form of monitoring, and has been accepted up and down The State of California by the different agencies, and also by many of the current groups of people.

In the clarification of monitoring for dispenser containment, it says in one of the paragraphs that this needs to be a audible visual alarm, and the regulators that we've dealt within the past have taken that audible vision as a way -- 'cause what this mechanism does it actually stops the flow of product. So you have an audible person out there that is saying, "I can't get my gasoline," and you have a visual because the dispenser is not pumping gas.

This form of leak detection, which is constantly there in a mechanical form, is not dependent on any kind on electrical source, and it's actually got in many of our dispenser containment pans has actually three floats so it's a redundant type of detection. But depending on the interpretation of audible or visual alarm, will depend on whether that is an accepted method, and so we are hoping to get some clarification by The Board.

Along that line, as far as what is used instead of a float mechanism it's a sensor that is put in that

S2-02

may also shut off the dispenser and alarm of belt, but you still may have product leaking into that dispenser containment. So that's where the float trip mechanism was adopted and accepted because it actually stopped the flow of the potential leak.

The other area that we are not sure whether as a dispenser containment manufacture we should be looking at is certifying the installers. Now, because the dispenser containment box that we sell or some has this float mechanism, it is also a form of leak detection, and we are not sure if that requires us -- we have done training of all our installers in the past, but to make sure we are keeping them up to date per the requirements, I need to know if that's something that Bravo Systems should be doing because they are manufacture dispenser containment again.

S2-02

The area that I would like personally some clarification on is, as far retesting of sumps, and you mentioned, and maybe you can clarify this now, is that it's per the original manufacture's test. And when I've gone back to the regulatory community that I deal with and I say, "Well, my manufacture's test it's a visual inspection" because it would do me, as a manufacture of any type of any type of secondary containment system, which we have many of them here in the audience today, for me to come up with a more stringent type of test, then visual inspection is going to send me out of the market.

S2-01

We all know that now when the sensor is installed, whether it's a dispenser sump, turban sump, they are water tested. In many situations where the sump is filled with water above that highest penetration fitting and leaks are looked for. To try to do this in the future with existing sites, where we have some sumps that can hold 300 gallons of water before you would get above that penetration fitting, we'd stand the chance of contaminating the ground with 300 gallons of contaminated water.

S2-02

And I know the industry is looking for other methods of testing, but the manufactures, in my own representing different manufactures, which I have several different forms of secondary containment systems, it's not in their best interest at this time to propose any more stringent of a test than a visual test. And when I propose this to the regulatory community they said, "Well, we are not going to accept visual testing, Jerry. That's ridiculous."

S2-03

However, the statement says that as the manufacture, that's all we require, and in some cases for some of the equipment, that's maybe all that it would be required. So if we can get any clarification on that. And I think those are the main issues we have.

MR. SILVA: Thank you. By the way did you put those in writing to the staff, those comments?

MR. USREY: No, but I guess I can.

MR. SILVA: Okay. Thank you. Now, we'll go to

LS 3

receved
July 18, 00

CALIFORNIA CUPA FORUM

"An Association of Certified Unified Program Agencies"

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July 17, 2000

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF CLEAN WATER PROGRAMS
2014 "T" STREET
P.O. BOX 944212
SACRAMENTO, CA 94244-2120

ATTENTION: CHARLES NESMITH

SUBJECT: COMMENTS AND SUGGESTIONS RELATING TO THE UNDERGROUND STORAGE TANK (UST) REGULATIONS

Attached are the comments and suggestions from the Southern California Technical Advisory Group of the California CUPA Forum Board relating to the Underground Storage Tank Regulations.

The Southern California Technical Advisor Group of the California CUPA Forum Board makes the following comments regarding the new Draft Regulations to the California Code of Regulations Title 23.

Issue #1: Article 4, Monitoring Requirements

This section covers the requirement to provide enhanced leak detection to those facilities with an applicable single wall component as part of their underground storage tank system.

The proposed regulation requires that the enhanced leak detection shall be conducted every three years. It is the view of this committee that this testing should be carried out at least annually.

The only existing method of enhanced leak detection available is a system that has been approved for annual tank testing. Since it is the opinion of the State Water Board that at a minimum annual tests are required to meet testing criteria then we believe that this test shall be performed at the same interval and in the same manner.

Even though this test may be in addition to other testing, we believe that if the third party testing initially done was approved on an annual basis then to validate the test and testing criteria it should be performed under the same standards.

53-02

This testing is only being done to tank systems with the least amount of protection and found in the most sensitive areas. The least that we can do is require that the testing be done on an annual basis. Additionally, we request that the regulations cover Sections 25288(a) and 25288(c). LS3-02

Issue # 2: Regulations Covering Sections 25288(a) and 25288(c)

Local Agencies must inspect every UST system at least annually. Local Agencies may require permit holders to employ special inspectors to conduct the annual inspection instead of and not in addition to the local agency inspection.

Since the law is going to require Local Agencies to perform annual inspections and the State Water Board's guidance on inspections requires that inspectors dismantle, open, manipulate and otherwise do a hands on inspection. We have concerns with requiring our inspectors to become service technicians.

If we require third party service personnel to be certified, and we are dictating the certification, then we should not have to be at the site every year while they are performing certification? Should we be requiring our inspectors to lift manways and unlock dispensers and monitoring systems so that we can verify that an appropriate inspection has been performed, we believe not. Or is it appropriate to perform a facility inspection without hands on and check to see if the overall facility maintenance appears satisfactory? We should require that they show all documentation that monitoring certification has been performed as required. If so, then every other year or every three years should be satisfactory in requiring that the certification be done in the presence of an inspector. LS3-06

We would like to thank you for the opportunity to respond to these issues at your public hearing. The questions above have not been resolved and will have significant impact on Local CUPAs, PAs, and DAs.

Sincerely,

B. DOUGLAS SNYDER
California CUPA Forum Board Vice Chairman

LS3

there are occasions when we don't want to waive it, and 48 hours is a little bit of a short fuse. I think that -- I don't have a problem with leaving the 48-hour requirement in there, I just think there needs to be a provision whereby the local agency has the authority to say, "No. We want to set a specific date and time to do that."

MR. NeSMITH: Okay.

MR. SILVA: Thank you. We've got two more speakers. There is Jim Smith, San Bernardino County Fire.

MR. SMITH: Good morning. I am Jim Smith, San Bernardino County Fire, also representing California Cooper Farm. Just a couple of quick comments. One has to do annual inspections that you pointed out as amendment package and regulations. Our comment on the annual inspections that are required under this SB 989, is that we need a standard for what an inspection is, and that The State of the California and the Water Board has provided us with information on what they feel is an adequate inspection technique.

LS306

We don't disagree with that. We do disagree with the fact that we won't be able to get to all these facilities and be able to do that. We are not, due to risk management and whatnot able to allow our inspectors in the field to go out and do a lot of the hands on inspecting that you've asked for.

We try to go out when there is people that come out to do their annual certification, and go along with them and get our inspection done at that time. And that works fairly well; however, that's a scheduling problem in a large county such as mine, or Los Angeles, San Diego, Orange County, other places. Small cities can sometimes get to that, but it is a problem, and we've given you some written comments on that.

L53-06

Secondly, on the enhance leak detection issue. Certainly, we feel that those areas that are within reasonable proximity, close proximity to drinking water wells, need to be watched and studied, and that drinking water is incredibly important to all of us.

Our county has greater than 90 percent of its drinking water supply comes from underground. And we have several locations where we have rather relatively high ground water. On the enhance leak detection issue, we don't understand why they would take a system that they have third party approval for to be a leak detection monitoring system on an annual basis, and as an enhanced system, only do it every three years.

L53-02

I am not trying to make a fortune for Tracer Tech Technology, and I certainly stand with everyone else that the more companies that can do some type of enhance system, the better it is for everyone. But I also believe that if this is a critical issue, that it needs to be done on an annual basis, not every three years.

On dispenser containment. On the monitoring of dispenser containment, there is question that's been brought up about the regulations saying they need to be audible and visible. The monitoring, does the fact that the pump shuts down, does that meet that requirement? One of the problems that we have with the float systems that are in these dispenser containment tanks, is that unless they have extremely good housekeeping at the facility, the float systems tend to have changed, they break or are improperly adjusted, or that they fill up with filters that might sit on the float, so it won't actuate. Or there is just trash, garbage, debris, dirt in there that the floats don't work.

On the inspection that we go to, there is a good 40 percent of them that the floats aren't functioning properly in those dispensers. That brings us to the other side of what we do, and that is a fire hazard. If you have a containment system that is that close to vehicle traffic and people, persons's traffic and you have them filled with gasoline, you have yourself an extremely high fire hazard.

25303

And so we like the idea that the monitoring system should be audible and visible. We like the idea that that monitoring system should be loud enough that something is done about it immediately, and we like the idea that that monitoring system when it goes in an alarm, shuts the product flow down, so that something needs to be done.

If you have shear valve trip valve in a three compartment containment box, one of those dispensers is leaking, and that shuts down the premium grade of fuel because that shear valve trips, and hasn't filled up to fill the other two, I'm still going to account for that pump to be pumping his gas, and taking his risk because there is gasoline sitting in that containment system.

LS3-03

On secondary containment testing, they mention -- well, our company says that visual is good enough, fine. We will let you do visual, but you're going to have to get that box up out of ground, so we can look at the bottom of it; however, secondary containment, we feel is incredibly important to test the secondary containment system.

There is a fact that whatever monitoring systems we put in there, whatever we've done on the secondary containment is based on the fact that that secondary containment is there and functioning. We could put the fanciest monitoring systems in the world to the secondary containment, but if there is a hole on the side and the product continues to leak out, we'll think we've got no problems.

LS3-01

But we might be contributing to contaminating the environment, due to the fact we assumed there's no problem here. That's why the secondary containment issue was brought forward. That's why we feel it's important. Secondly, on secondary containment systems, when you talk about dispenser containment boxes, Carl brought forward that underneath one of those systems there are buried components that you can't see.

At least if you pressure test the secondary containment piping system, whatever those flexible boots and connectors under there, will be tested at that time. And you will have some idea, whether or not, they are sound, and they are still there. As far as installation certification goes, in my 18 years of doing this job and underground storage tanks, I've seen almost every mistake that can conceivably be made. They continue to happen on a daily basis to companies that have been in business for a long time. LS3-05

There is a high turnover of personnel in this industry, and we feel that whatever education that we can get for these people so they will be properly prepared and able to do the job, is better for everyone. The guy that owns the gas station, the guy that is trying to monitor the gas station, and those of us that have to regulate that gas station. LS3-04

We have certainly met a large number of people that go out to do annual certification inspection, and they have no training, just whoever they are. Anyone here at this Board can go out to Joe's gas station punch the test button, and write him a certificate saying, "I came and checked your system. It worked the way it was supposed to." So there you go.

We think that if you're going to have these systems in place that we need to have some kind of verification, some kind of insurance that they are working. If we don't test these systems, if we don't follow through on this, then we might as well not put them in the ground. Thank you.

MR. SILVA: Next speaker is Mr. James White, White Environmental Services.

MR. WHITE: For the record my name is Jim White. I'm the principal with White Environment Association, Brea, California. I have been associated with the California and federal tank programs from the start, beginning with legislation. I work very diligently on behalf of the major oil company to affect some of the regulations that we are now looking to amend.

Given that background, I have to support the overall approach that has been taken, not only by SB 989, but also by the Water Board; however, I do have some very serious concerns. One happens to be perhaps a little bit outside the scope of this hearing, but I think it merits bringing it up. As many of you know, we have 107 different agencies out there that are very antonymous.

They don't report to anybody, but their own local governing agencies or governing bodies, and there is a whole lot of inconsistency, interpreted problems, and I understand that the Water Board has issued the LG letters to kind of bring more consistency and my hat's off to them for that.

However, over the past couple of years there

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L4

FAX

To: Mr. Charles NeSmith, SWRCB, Division of Clean Water Programs

From: M. L. Sarantis for Evelyn Gibson **Fax:** 227-4349

Pages: 2 **Date:** July 19, 2000

Re: **CC:**

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply**

● **Comments:**

If these comments are a duplicate of letter already received, my apologies! We had some transmission difficulties and I wanted to be certain that this letter was received.

CIOMA CALIFORNIA INDEPENDENT OIL MARKETERS ASSOCIATION

3831 North Freeway Blvd., Suite 130 • Sacramento, CA 95834-1928 • Tel. (916) 646-5999 • Fax (916) 646-5985

July 18, 2000

Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
2014 "T" Street
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith:

The California Independent Oil Marketers Association (CIOMA) has concerns about the proposed regulations for implementing SB 989. Although we believe the regulations have approached many of the statutory requirements as reasonably as possible, we do believe it is important for state officials to understand that implementation of these regulations will create many operational problems and financial difficulties for the small businesses which upgraded and replaced their underground storage tank systems just a few months ago. LS4-01

Small business tank owners, such as those CIOMA represents, cannot continue to install new equipment every year to comply with new statutory or regulatory requirements. It is economically infeasible for these small businesses to incur these costs and not have time to amortize those expenses before new requirements are mandated. Furthermore, small businesses in particular rely upon regulatory agencies to identify appropriate equipment and technology to meet regulatory requirements. Our members are extremely upset and concerned that they installed equipment just months ago which local and state oversight agencies indicated were effective in protecting the environment from product releases or in identifying when product has been released only to now find the equipment has been deemed ineffective. Our members believe that during the 10-year period given tank owners to upgrade their underground storage tank systems, government and industry should have been better able to determine what equipment was necessary to effectively prevent and detect product releases from these tanks.

Of particular concern with these proposed regulations are new requirements for monitoring systems that permit periodic testing of all secondary containment components. Tank owners should have been made aware of the need for this type of monitoring earlier so that the work done to comply with the 1998 underground storage tank mandate could have addressed this requirement. Likewise, the requirement for installation of under-dispenser containment should have been addressed before the 1998 upgrade work was completed. Now, the costs of compliance with these requirements will be much higher and will disrupt operations again as tank owners must dig up their sites and shut down operations once more. Costs to small businesses for these requirements are now much higher than they would have been if the requirements had been adopted before tank upgrade and replacement was completed.

Although the regulations simply implement what was required by SB 989, CIOMA would like to express concern about the proposed requirement for all installation, repair, and maintenance of tanks to be carried out by licensed contractors certified by tank or monitoring equipment manufacturers. Not only will this requirement increase the costs of the services provided by these workers by the amount of expense those contractors incur for obtaining this training. The proposed regulations also give manufacturers the ability to limit the number of contractors able to do the work, potentially increasing installation, repair, and maintenance costs exponentially when the supply of licensed and certified contractors fails to meet demand. LS4-02

In short, these regulations are a serious operational and financial blow to the small tank owners who serve California, particularly in its rural regions. CIOMA commends the staff of the Underground Storage Tank Program for its longstanding proactive and positive approach to regulating underground storage tanks and their extensive outreach programs directed at tank owners. However, we strongly encourage earlier government/industry activities to detect problems with underground storage tanks and ways to correct those problems. Longer lead times and multiple sources of technology to address problems are critical to ensuring small tank owners can continue to meet the ever-changing needs to protect California's water resources and stay in business.

Thank you for consideration of CIOMA's concerns.

Sincerely,

Evelyn Gibson
Government Relations Director

L5

From: "Dinkfeld EC (Edward)" <ecdinkfeld@Equiva.com>
To: "'nesmithc@cwp.swrcb.ca.gov'" <nesmithc@cwp.swrcb.ca.gov>
Date: 6/12/00 10:55AM
Subject: Comments on Proposed Amendments to the UST Regulations

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
2014 "T" Street
P.O. Box 944212
VIA E-mail & Facsimile
Sacramento, CA 94244-2120

Dear Mr. Nesmith,

Equiva Services LLC (Shell and Texaco) submit the following comments on the Proposed Amendments to the Underground Storage Tank Regulations. The page numbers below reflect the internet version of the proposed amendments to the regulation.

* Page 5 definition should read "Dispenser Spill Containment or control system"
  Page 18 Section 2636.1 make above change
  Page 18 Section 2636.2 make change above
  Page 20 Section 2636.4 make change above

L5-02

* Section 2635 (d) (1) on page 14 currently reads "This certification must be renewed every 36 months upon completion of refresher training provided by the manufacturer." The word "upon" should read "by". L5-03 It is also unclear as to the effective date for the initial refresher training requirement for those people who are currently certified installers. L5-04

* Page 21, Section 2637 (b) (1) (A) is unclear as to requiring all of the licenses listed, one of the licenses or a combination. If only one of the licenses is required, we suggest adding "or" after each listed license. L5-01

Thank you for the opportunity to comment.

Regards,

Ed Dinkfeld

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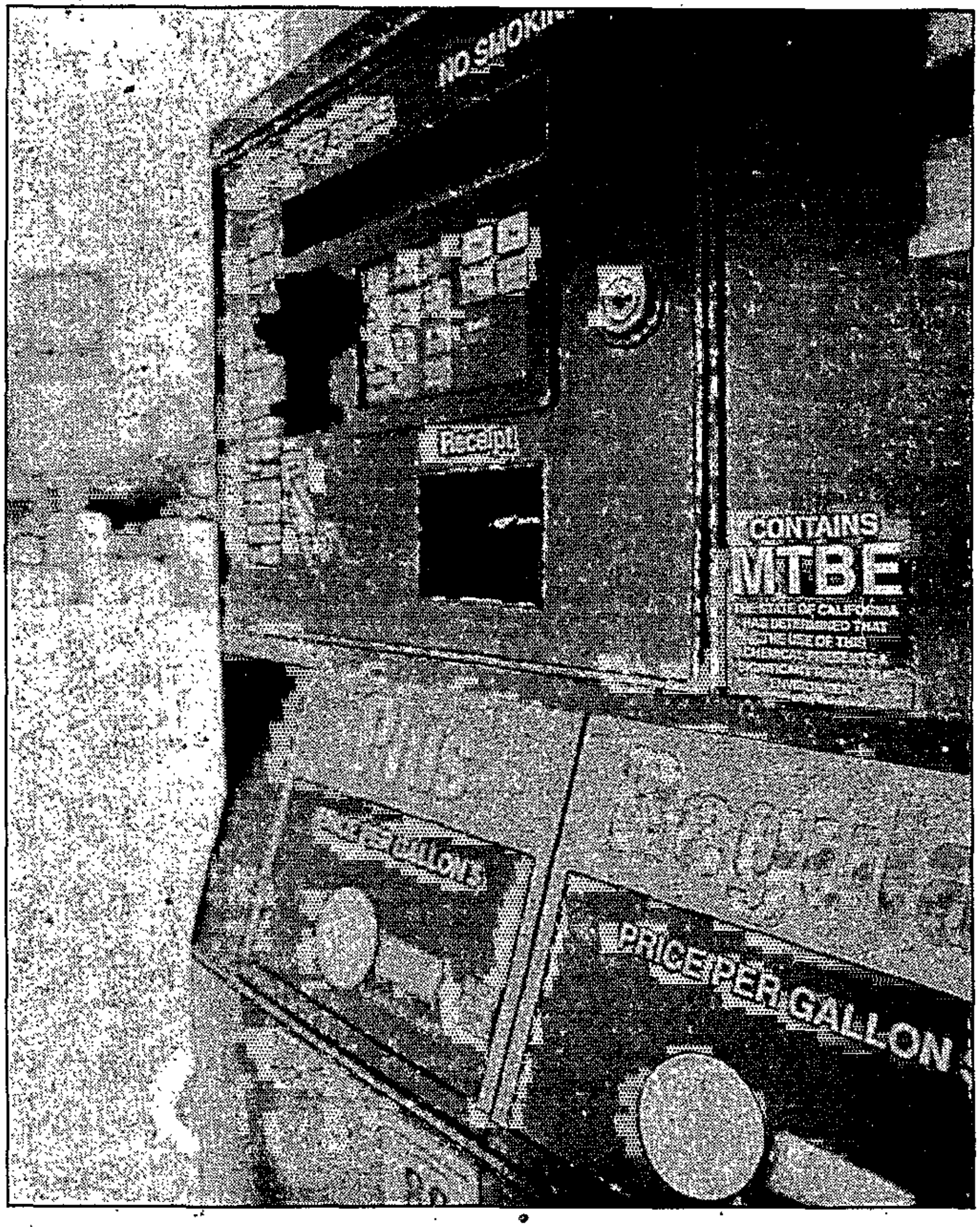
L6-06

UNCONTROLLED LUSTs



CALIFORNIA'S FAILURE TO PROTECT OUR WATER FROM LEAKING UNDERGROUND FUEL STORAGE TANKS

ENVIRONMENTAL WORKING GROUP™

ZEV ROSS
BILL WALKER

Acknowledgements

Thanks to Richard Wiles of EWG for analytical guidance and editorial assistance. Thanks to Teresa Schilling and Liza Pike of EMS for help with message and release strategy, and to Joseph Gonzalez and Denny Larson of Communities for a Better Environment.

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Contents

1. Executive Summary

California regulators have failed to order cleanup or take other legally binding enforcement action on more than 90 percent of the thousands of underground fuel storage tanks known to be leaking toxic chemicals into water and soil throughout the state, although many of the leaks were first reported more than 10 years ago, according to an Environmental Working Group (EWG) computer-assisted investigation. Even when cleanup was ordered, regulators almost never fined even the biggest polluters.

EWG's analysis of state data on 36,000 leaking underground storage tanks (LUSTs) dating to 1970 found that where enforcement details are available, no enforcement action was taken in more than 80 percent of the cases and non-enforceable warnings were issued in another 10 percent. Binding enforcement action was taken less than 8 percent of the time. About one-third of the cases have been open at least 10 years and two-thirds at least five years.

According to state records, no binding enforcement action was taken in more than 80 percent of the 36,000 known cases of leaking underground storage tanks.

But "closed" cases don't necessarily indicate cleanup or action to stop ongoing pollution. In the late 1990s, the state Water Resources Control Board fast-tracked sweetheart settlements for leaking tank sites, closing many cases without adequate review, cleanup, containment, or penalties for the responsible parties. According to the state Joint Legislative Audit Committee, many closures were too hasty, "allowing contamination to spread further, essentially unnoticed." (JLAC 1999.) In at least some cases, regional water board staff may have profited personally from cutting closure deals. (Clifford 1996.)

EWG's study is the first analysis of enforcement for all leaking tanks identified in California. But three different state or federal audits that reviewed selected cases have all found the state's entire regulatory system for underground storage tanks seriously flawed. Not only is enforcement abysmal once leaks are reported, there is virtually no effective monitoring to detect leaks before they threaten water supplies. In a hearing last year, a UC Davis water expert testified that California's efforts to assess toxic threats to groundwater "lag far behind those of other states." (JLAC 1999.)

The state continues to respond reactively, waiting for problems instead of heading them off. Gov. Davis has ordered a phaseout by the end of 2002 of the gasoline additive MTBE, a possible human carcinogen that contaminates an estimated 10,000 leaking tank sites statewide and has forced the closure of drinking water wells in Santa Monica, Lake Tahoe, Sacramento, Santa Clara and Kern County. But the great majority of leaking tanks, containing an array of known carcinogens and other toxic chemicals that could pose a greater threat than MTBE, go on polluting water and soil without action by the state water board, regional water boards or state health department.

Fourteen major oil companies are responsible for more than one-third of the cases where leaking underground tanks contaminate water.

Petroleum products account for almost all toxins leaking from underground tanks, and in California 14 large oil companies are responsible for more than a third of the open cases where leaking tanks contaminate water. These same 14 companies have received more than $180 million in reimbursements from a state cleanup account funded by fees paid by all owners of underground tanks. These fees are passed on to consumers as higher gasoline prices, meaning the public indirectly pays for cleaning up the companies' leaks.

Most of the tank fees are paid by independent service station operators, who merely store and sell the oil companies' products, often in tanks provided by the producers. Other than these fees, the state has assessed financial penalties against oil companies for tank leaks just a handful of times, even though the oil industry has known for many decades that its products were leaking from underground tanks and poisoning water supplies, but continued distributing those products without warning the public or service station operators. (EWG 2000.)

Although most underground tanks in California have now been upgraded, state and local regulators have found that the new tanks also often leak and their leak detection systems often don't work. (SWRCB 1999b, Santa Clara County 2000.) Unless state regulators take aggressive steps to identify and contain all leaks, adopt a comprehensive and reliable monitoring program to catch leaks before they spread to water supplies, act swiftly to order cleanup of contaminated sites, practice rigorous enforcement to deter future contamination, and hold the producers of the contaminants responsible, the threat from California's leaking underground storage tanks will grow worse.

Summary of Findings

• Since 1970 about 36,000 leaking underground tanks have been reported statewide, but 36.3 percent of the case records in the state's database provide no enforcement information at all.

• Of the 23,000 cases where enforcement details are recorded, *no* action was taken in 82.1 percent. Non-binding warnings or other informal notices were issued in 10.3 percent. According to state records, binding enforcement action was taken in 7.6 percent of cases; cleanup and abatement orders were issued in just 73 cases; and what the state water board calls "punitive action," the category that includes fines, was applied only 42 times. The exact number and amount of fines is unknown. (Table 1.)

• Of 16,000 cases still open — that is, where pollution is ongoing — two-thirds were identified before 1995 and one-third before 1990. Hundreds of open cases were first reported before 1985. (Table 2.)

Table 1. Legally binding enforcement action was rarely taken against operators of leaking underground storage tanks.

	Cases	Percent
No Enforcement Action Taken	18,962	82.1%
Warning or Informal Action Taken	2,389	10.3%
Enforcement Action Taken	1,758	7.6%
Total Cases	**23,109**	

Source: EWG, from SWRCB LUSTIS, 2000.

Table 2. A third of leaking tanks were first reported before 1990.

Year Reported	Cases Opened	Percent of Open Cases
Before 1985	237	1.5%
Before 1990	5,180	32.8%
Before 1995	10,479	66.4%
Total Open Cases	**15,784**	

Source: EWG, from SWRCB LUSTIS, 2000.

About 15,000 of the open and closed leak sites affect water, and about 18,000 affect soil. Binding enforcement action was taken in about 12 percent of water cases, compared to 5 percent of soil cases. While contaminated water is clearly of high priority, chemical plumes in soil can spread hundreds of feet in only a few years to nearby wells and aquifers. MTBE not only migrates through soil unusually rapidly but accelerates the spread of other chemicals that also leak from underground fuel tanks, including benzene, a known human carcinogen, and tolulene, a known human reproductive toxin.

Table 3.
14 major oil companies are responsible for thousands of leaking tank sites.

Company	Cases
Chevron	1,537
Unocal	1,137
Shell	1,120
Arco	896
Mobil	812
Texaco	626
Exxon	545
Thrifty	292
Beacon	208
BP	141
76 Products	118
Ultramar	63
World Oil	53
USA Petroleum	37
Total	**7,585**

Source: EWG, from SWRCB LUSTIS, 2000.

• Underground storage tanks are leaking toxic chemicals into water and soil in every county in California, but levels of enforcement vary widely by region. Sixty-three percent of all open cases in San Jose were first reported at least 10 years ago, but only 32 percent of Los Angeles cases are that old.

• Storage tanks owned and operated by 14 major oil companies, or used by independent dealers to store fuel sold by those companies, make up 21 percent of all known sites and 36 percent of all open cases affecting water. San Francisco-based Chevron Corp. is responsible for more than 1,500 cases. Unocal Corp., based in Los Angeles, and Shell Oil Co. are each responsible for more than 1,100 cases. (Table 3.)

• Of cases involving major oil companies, no enforcement action was taken 79.4 percent of the time, informal action in 12.8 percent and binding enforcement action in 7.8 percent. Since 1970, only seven oil company cases have resulted in fines or other punitive action. More than 40 percent of state records on leaking tank cases involving major oil companies provide no enforcement information at all.

Recommendations

• As the 1999 Joint Legislative Audit Committee report concurs, criminal penalties should be applied when a tank owner or operator allows a leaking underground storage tank to contaminate drinking water.

• The state should develop an aggressive statewide enforcement plan built on the assumption that any tank leak or spill is unacceptable, and must be cleaned up as soon as possible to prevent further contamination.

• The state should fine or otherwise penalize owners whose tanks leak, those who fail to report leaks promptly, and those who fail to perform required cleanup. The severity of the penalties should take into account the company's size and statewide extent of its pollution. Penalties should increase for repeat offenses.

• The state water board, regional boards and local agencies must follow through to enforce cleanup and containment orders promptly.

• To prevent fraud, regulators should step up inspection of upgraded sites and no longer allow companies to "self-certify" their own compliance with upgrade requirements.

Criminal penalties should apply when a tank owner or operator allows a leaking underground storage tank to contaminate drinking water supplies.

2. A Nationwide Threat

In 1984, in response to nationwide concern that thousands of leaking underground storage tanks were contaminating groundwater and threatening human health, Congress passed amendments to the Resource Conservation and Recovery Act that mandated construction standards for new tanks, reporting and record-keeping requirements for existing tanks, compliance monitoring and enforcement. Although the size of the problem was still unknown, the U.S. Environmental Protection Agency estimated there were over two million underground storage tanks and that three-fourths were made of unprotected steel, "proven to be the most likely [design] to leak and thus create the greatest potential for health and environmental damage." (EPA 1998.) EPA and oil industry studies at the time estimated that 10 to 30 percent of tanks in the U.S. were already leaking.

More than 15 years ago, the EPA warned that underground tanks were likely to leak and endanger public health and the environment.

In 1988, EPA adopted regulations to implement the new law, which also allowed states to set up their own regulatory systems in compliance with national standards. Bowing to industry pressure to ease the burden on "mom and pop" gas stations, federal and state regulators gave tank owners 10 years to replace single-walled steel storage systems with double-walled fiberglass tanks and pipes. This delay may have minimized the impact on small businesses, but it also allowed years of unabated pollution.

In California, underground tanks are regulated by the state Water Resources Control Board, which oversees a permit program that requires tank owners to file an acceptable plan for monitoring, preventive maintenance and removal and disposal of hazardous materials. The permit program is implemented by the nine regional water quality control boards and 107 local agencies, mostly county environmental health departments and city fire departments.

These local agencies are the lead regulators in about two-thirds of leaking tank cases statewide. Tank owners are required to immediately notify the local agency of leaks or spills. Once a leak has been reported, the regional water boards are responsible for working with the local agencies to contain and clean up leaks.

State Cleanup Fund

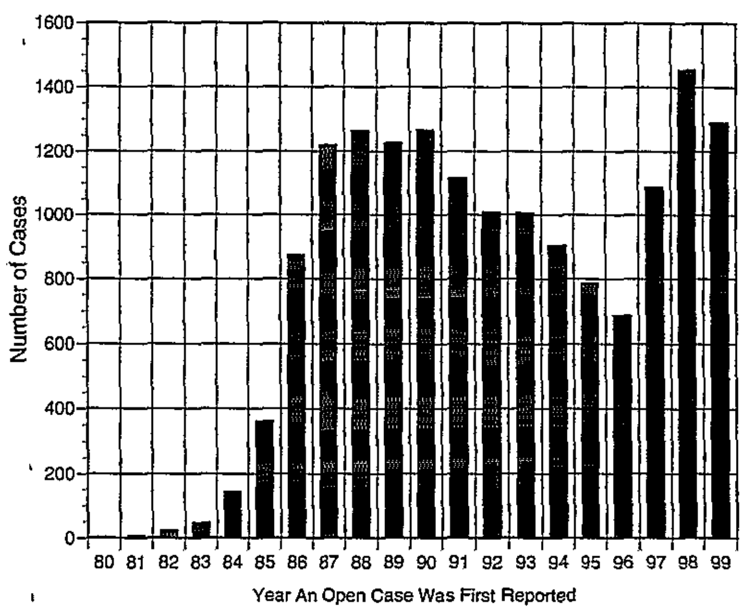
Because of concerns that small independent dealers would not have sufficient funds to clean up leaks from underground tanks, in 1989 California legislators set up a cleanup fund, also administered by the state water board. The owner of every underground gasoline tank pays a per-gallon fee, which generates about $170 million a year. Owners of leaking tanks undertaking cleanup can file claims of against the fund. In 1999 legislators increased the maximum reimbursement to tank owners from $1 million to $1.5 million, despite recommendations from local regulators that the amount be reduced to "create a disincentive . . . [against] those parties that delay cleanup and don't comply with agencies' requests . . . " (JLAC 1999.) As of April 2000 the fund had approved 12,000 claims and reimbursed tank owners for $848 million in cleanup costs.

Regulators were caught napping precisely during the years when the leaking tank problem became a full-blown crisis.

This scheme does not cover cleanup of leaks from tanks for which no owner can be identified, so in 1998 the state allocated $5 million annually from the fund to the state health department for cleanup of "orphan" sites. However, the health department's fund only covers pollution by "oxygenates" — chemicals such as MTBE that boost the oxygen content in gasoline so that it burns cleaner. It does not address contamination of orphan sites with other chemicals such as benzene and tolulene. (Calif. Health and Safety Code.)

The history of California's underground storage tank program shows how regulators were caught napping precisely during the years when the problem became a full-blown crisis. Reported cases per year rose from just eight in 1980 to 793 in 1985 and a high of 3,954 in 1990. By the beginning of 1985, just 482 leaking tanks had been

Figure 1. Reports of leaking tanks soared after 1985.



Source: EWG, from SWRCB LUSTIS, 2000.

reported; by the end of 1995, when the MTBE threat was becoming widely known, the total had jumped to more than 28,000. (Figure 1.)

The state's regulatory program has also been tarnished by allegations of scandal and fraud. Beginning in 1995 the state Water Resources Control Board fast-tracked sweetheart settlements for many leaking tank sites, closing many cases without adequate review, cleanup, containment, or penalties for the responsible parties. This policy was heavily influenced by a state-commissioned study from Lawrence Livermore National Laboratory which failed to consider MTBE contamination — a threat that was clear by the time the report was issued — and recommended that cleanup should be a priority only where benzene leaks threatened water supplies. According to the Joint Legislative Audit Committee, many resulting closures were too hasty, "allowing contamination to spread further, essentially unnoticed." (JLAC 1999.) Craig Perkins, Santa Monica's director of environmental and public works, told the committee:

In the late '90s, regulators rushed to close many leaking tank sites without adequate review, allowing toxic contamination to spread unnoticed.

> We were dismayed to discover [in mid-1995] that concurrent with our efforts to identify the sources of contamination and figure out what had happened to our wells, the [Los Angeles] Regional Board had embarked on a frantic effort to [stop oversight on] as many underground storage tank sites as possible . . . (JLAC 1999).

In at least some cases, regional water board members may have profited personally from cutting closure deals. (Clifford 1996.) State and federal authorities, including the FBI, investigated evidence of criminal activity related to leaking site closures by the Los Angeles water board. While the FBI made no indictments, a number of staff members, including the executive officer, were fired, resigned or demoted in the wake from the investigation.

Federal Audit Blasts California Program

In 1997, the U.S. EPA Office of the Inspector General (OIG) released a scathing audit of underground tank programs in half a dozen states. The OIG found that the programs in California as well as Idaho, Kansas, New York, and Oregon did not "assess some sites to determine the risk for human health and the environment; or assign the appropriate level of oversight or enforcement relative to the potential risk. " As a result, EPA said, in each of the states regulators "did not always initiate clean-up efforts on some sites that were the most hazardous and threatening to human health and the environment, including those that posed a threat to drinking water." Specifically referring to California, the EPA wrote:

> [California's program] did not identify some sites most environmentally threatening to groundwater. Further, we found that the priority system established by the State was not being followed. As a result, some leaking tank sites affecting drinking water were not being cleaned up. We found that 48 of 69 leaking tank sites, identified as affecting drinking water, were not being cleaned up [promptly]. The leaks at these 48 tank sites had been known for 3 to 14 years. (EPA 1997.)

The EPA's audit further found that of the 38 leaking tanks reviewed by the OIG, "enforcement action [that was taken] appeared appropriate at only one site." For 13 of those sites the state took no enforcement action although the leaks had been reported for 2 to 11 years; for 19 sites where clean-up and abatement orders were issued "the owner or operator had not complied with the terms of the order and no enforcement actions were taken to assess penalties for noncompliance." And for five sites penalties "were only a small fraction of the amounts that could have been assessed."

State Audits Confirm Lack of Enforcement

Auditors found that regional water boards often delayed taking enforcement action against tank owners for up to 10 years — when they acted at all.

The California State Auditor, in an equally scathing 1998 report, concluded that "although the State of California has ample evidence that gasoline leaking from underground storage tanks is jeopardizing the safety of our drinking water supplies, it has not acted quickly and decisively to address this potential health hazard." The Auditor found that the state failed to ensure swift identification of contamination, failed to follow through on cleanup orders and failed to take enforcement action against polluters who delayed cleanup. (State Auditor 1998.)

The state audit found that on average it took polluters more than two years to identify the extent of the contamination, compared to a "reasonable time frame" of six months. The audit found that regional boards "took as long as 10 years to penalize responsible parties for delaying such critical activities as the removal of contaminants, site investigations and submission of technical reports." In many cases the regional boards took no action against polluters who refused to clean up their mess.

'Utter Frustration' With Cleanup Delay

In February 1999, the Joint Legislative Audit Committee held a hearing focusing on the delays in cleaning up contaminated tank sites. Chris Strohm, vice president of the South Lake Tahoe Public Utility District, which has lost a third of its drinking water supplies to MTBE contamination, recounted the regulatory history of just one of the ten underground contamination "plumes" discovered in the district:

> This plume started back in 1984 when our crews were digging a ditch across from a gas station for a water line. The gasoline fumes were so strong across the street that they were afraid they'd strike a spark and have an explosion. That was in 1984. The [regional water board] was notified and reminded numerous times of this plume. It wasn't until five years later, in 1989, that the [storage] tanks were removed.
>
> But the existing plume threatened homes, businesses and one of our large wells. In 1990 the regional board issued a cleanup order with a 1992 deadline. the responsible party did not meet the deadline and the regional board did not follow up. Later in 1992 the regional board required a work plan for a corrective action. It had to be done by 1993.
>
> 1993 came and went. In 1994 the responsible party finally produced a work plan - no action in cleaning up the plume or defining it - just a plan. In April of 1997 we delivered a letter to the regional board stating our utter frustration. We copied the state board; we copied you legislators; and we copied the press to try to hold the regional board accountable. [At about the same time] in 1997, the state board did an internal audit of the regional board and gave them a clean bill of health. This was a whitewash.
>
> Today the extent of the plume has not been fully determined, and cleanup has not occurred. And while we're holding these meetings, this and at least nine other plumes are spreading, and in some of our soils, they spread one foot a day. You see standing before you right now California's future. . . . Make the state agencies act, not just promise to act. We can't wait.

The lack of enforcement was again blasted in a 1999 report by the Joint Legislative Audit Committee. A private water engineer who has worked on many site cleanups attributed the lax enforcement to the politically-motivated unwillingness of both the Wilson and Davis administrations to crack down on major oil companies:

If the political agenda does not promote enforcement, regulators will allow more and more contamination to remain in the ground.

> Although [state law] requires the Water Board to take action against non-compliant responsible parties, it is common practice for Board staff to routinely not penalize responsible parties who fail to comply with agency requirements. [This is particularly prevalent with] larger responsible parties who have the money and resources to defend themselves in the technical and legal arena. The environmental regulatory [system] generally follows the current political agenda. If that agenda does not promote environmental enforcement, the regulators will continuously rationalize that more and more contamination is acceptable to leave in the ground . . . [JLAC 1999.]

Orange County's director of environmental health told the committee that current state law, which provides only civil penalties for underground tank leaks, is inadequate to deter large corporate offenders:

> You need criminal violations to get the attention of the businesses . . . Our district attorney's office also indicates that [the state] needs more teeth in your law. We need something to give the local agencies other tools to deal with tank violations . . . and for the district attorney to pursue [those cases]. (JLAC 1999.)

Meanwhile, tank owners took full advantage of the regulatory void. As a result of a 1998 bill sponsored by Atlantic Richfield Co. and signed by former Gov. Pete Wilson, operators of underground storage tanks are allowed to "self-certify" that they have complied with required tank upgrades. But recent inspections in San Joaquin, Sacramento and Los Angeles counties suggest that at least one company used self-certification to deceive regulators and avoid doing necessary upgrades. In April 2000, the state Environmental Protection Agency launched an investigation into whether ARCO falsified public records to show that its stations complied with mandates for upgrading underground fuel tank systems to prevent leaks that threaten drinking water wells.

In August 1999, San Joaquin County sued ARCO for allegedly operating tanks without permits, engaging in unfair competition and "making any false statement, representation or certification" in required documents. The suit was settled that December, and the discoveries in San Joaquin County led to inspections in Sacramento and Los Angeles counties. According to a California Environmental Protection Agency memo acquired by *The Sacramento Bee,* even though the stations had been issued upgrade certificates, investigators discovered that stations in both of these counties still had steel piping rather than the required fiberglass.

The state is concerned that fraudulent self-certification may not be an isolated incident. In enforcement alerts issued to agencies that implement underground tank laws, the state water board said that "the violations already found in isolated, random inspections at either end of the state may be an indicator of widespread problems." (SWRCB 2000).

In one local water district, "upgraded" tanks still had problems with leaks.

Compliance with the upgrade standards, however, is no guarantee a tank won't leak. At least two studies, one by a state panel convened by former Gov. Wilson and one conducted by the Santa Clara Valley Water District, have found that the new tanks do not live up to their expectations. In each of the studies researchers found extensive contamination that they attributed to the new tanks. In fact, in a detailed analysis of 16 tank sites with extensive MTBE contamination, the Santa Clara district determined that tanks that met the new upgrade standards were likely the source of contamination at 13 sites, or 80 percent of the cases reviewed.

3. Findings

California has known about the potential for widespread water contamination from leaking underground storage tanks for more than a decade. The state, however, has not taken adequate steps to address this threat. This widespread failure to enforce the law has delayed cleanups, let most violators off the hook, exacerbated groundwater pollution, and worst of all, led to a regulatory environment that has utterly failed to deter polluters. The largest oil companies knew well over 30 years ago that petroleum storage tanks were leaking -- a study of the problem by the American Petroleum Institute dates to 1972 — and did nothing about it (CBE 1999). The widespread contamination of California groundwater by MTBE and other chemicals was not accidental but foreseeable and preventable.

Underground storage tanks are leaking toxic chemicals into groundwater in every California county. According to state records, there are 934 open cases of tanks contaminating groundwater in Los Angeles County. San Diego County has 744 open groundwater cases, San Diego County has 744, Orange County has 686, Alameda County has 586 and San Mateo County has 513. Among cities, San Jose has 236 open cases of tanks leaking to groundwater, San Diego has 190, Santa Rosa has 171, Los Angeles has 168 and Oakland has 154. (Table 4a-b.)

Nearly all (99 percent) of the contaminants leaking from underground storage tanks are petroleum products and include gasoline, jet fuel, hydrocarbons, paint thinner and waste oil. In addition to the petroleum products, a small number of cases also involve a long list of other toxic chemicals. These include arsenic, lead, chromium, and perchlorethylene and trichloroethylene, both known carcinogens and suspected reproductive toxins. (Table 5.)

Although almost all of the contaminants leaking from underground tanks are petrochemicals, tanks are also polluting groundwater with arsenic, lead, chromium and other toxic chemicals.

Delays in cleanup of leaking underground tank sites vary widely by region. More than 45 percent of open cases under the jurisdiction of the San Francisco regional board were first reported more than ten years ago. But in the Central Valley region, which has about the same number of open cases as San Francisco, fewer than 25 percent of open cases were first reported more than ten

Table 4a. Leaking tank sites by county.

Rank	County	Total Sites	Open Sites	Closed Sites	Sites That Contaminate Drinking Water*
1	Los Angeles	5,497	2,104	3,393	63
2	San Diego	3,274	1,518	1,756	798
3	Orange	2,600	1,177	1,423	845
4	Alameda	2,288	1,129	1,159	24
5	Santa Clara	2,211	764	1,447	149
6	San Francisco	1,349	318	1,031	0
7	Ventura	1,261	372	889	0
8	Riverside	1,129	448	681	296
9	San Mateo	1,125	682	443	24
10	Sacramento	1,119	545	574	254
11	Sonoma	1,028	533	495	646
12	Kern	1,008	260	748	98
13	San Bernardino	1,001	529	472	165
14	San Joaquin	904	542	362	310
15	Contra Costa	808	372	436	107
16	Santa Barbara	749	281	468	220
17	Fresno	711	378	333	129
18	Humboldt	516	342	174	227
19	Tulare	466	200	266	149
20	Solano	453	182	271	65
21	Stanislaus	425	197	228	167
22	Monterey	399	221	178	8
23	Placer	391	271	120	192
24	Merced	363	153	210	142
25	Mendocino	358	189	169	145
26	Marin	331	151	180	6
27	Napa	320	149	171	6
28	Santa Cruz	304	157	147	4
29	Shasta	294	89	205	154
30	Yolo	249	112	137	111
31	Butte	228	83	145	113
32	Yuba	204	153	51	47
33	Madera	201	86	115	15
34	San Luis Obispo	199	73	126	3
35	Imperial	185	33	152	43
36	Nevada	185	108	77	86
37	Siskiyou	174	73	101	73
38	Kings	173	77	96	100
39	El Dorado	154	85	69	85
40	Tehama	134	39	95	53
41	Tuolumne	127	90	37	51
42	Inyo	99	50	49	43
43	Del Norte	97	56	41	52
44	Calaveras	95	56	39	24
45	Sutter	86	46	40	32
46	Lake	83	48	35	33
47	Mariposa	79	30	49	28
48	Trinity	74	43	31	21
49	Mono	66	34	32	22
50	Amador	58	40	18	23
51	Plumas	54	10	44	27
52	Colusa	52	38	14	20
53	San Benito	52	13	39	1
54	Glenn	40	16	24	21
55	Lassen	30	21	9	22
56	Alpine	13	4	9	5
57	Sierra	12	9	3	5
58	Modoc	11	5	6	5
	Total	**35,896**	**15,784**	**20,112**	**6,557**

Source: EWG, from SWRCB LUSTIS, 2000.

Table 4b. Leaking tank sites in leading cities.

Rank	City	Total Sites	Open Sites	Closed Sites	Sites That Contaminate Drinking Water*
1	San Francisco	1,341	315	1,026	0
2	San Diego	1,213	466	747	148
3	San Jose	1,042	380	662	95
4	Oakland	781	393	388	7
5	Sacramento	716	336	380	184
6	Los Angeles	668	294	374	16
7	Stockton	504	312	192	166
8	Bakersfield	492	81	411	34
9	Fresno	405	200	205	44
10	Santa Rosa	365	197	168	266
11	Anaheim	333	85	248	74
12	Long Beach	332	176	156	0
13	Oxnard	293	79	214	0
14	Hayward	291	194	97	0
15	Santa Ana	282	180	102	140
16	Camp Pendleton	270	231	39	102
17	Riverside	238	106	132	68
18	Santa Barbara	227	103	124	134
19	Vandenberg AFB	226	84	142	0
20	Napa	223	107	116	5

Source: EWG, from SWRCB LUSTIS, 2000.

Table 5. Almost all of the contaminants leaking from underground tanks are petroleum products.

Substance	All Cases	Open Water Cases
Gasoline	19,668	5,256
Diesel	6,215	841
Waste Oil	2,683	381
Unleaded Gasoline	1,331	377
Misc. Motor Vehicle Fuel	1,097	366
Hydrocarbons	776	157
Heater Fuel	671	133
Regular Gasoline	653	114
Solvents	303	42
Jet Fuel	167	29
Boiler Fuel	150	28
Mineral Spirits	109	19
Bunker Fuel Oil	99	16
Kerosene	84	16
Motor Oil	73	15
Benzene	71	15
Stoddard Solvent	61	12
#6 Fuel Oil	60	10
Premium Gasoline	58	6
Oil & Grease Waste	50	6
Lead	48	6
Toluene	34	6
Paint Thinner	31	5
Xylene	30	4
Other/Undefined	1,374	174

Source: EWG, from SWRCB LUSTIS, 2000.

years ago. About 40 percent of cases in the Los Angeles region are more than ten years old, but in the San Diego region only 25 percent are that old. The Central Coast and Lahontan (Tahoe basin) regions also have about the same number of open cases, but more than 31 percent of Central Coast cases are more than ten years old, while fewer than 15 percent of Lahontan cases are that old — the best performance percentage in the state. (Table 6.)

Table 6. Leaking tank cases are backlogged all over the state.

Regional Board	Total Open Cases	Opened Before 1990	Percent Before 1990	Opened Before 1995	Percent Before 1995
San Francisco Bay	3,720	1,687	45.3%	2,932	78.8%
Central Valley	3,679	904	24.6%	2,108	57.3%
Los Angeles	2,394	946	39.5%	1,731	72.3%
Santa Ana	1,652	501	30.3%	998	60.4%
San Diego	1,615	407	25.2%	978	60.6%
North Coast	1,095	353	32.2%	749	68.4%
Central Coast	793	252	31.8%	527	66.5%
Lahontan	612	88	14.4%	352	57.5%
Colorado River	224	42	18.8%	104	46.4%
Total	**15,784**	**5,180**		**10,479**	

SOURCE: EWG, from SWRCB LUSTIS, 2000.

Since 1970 about 36,000 leaking underground tanks have been reported statewide, but 36.3 percent of the case records provide no enforcement information at all. Some regional water boards were far better than others at recording enforcement activities in the state database.

For example, the San Francisco and the Central Valley water boards, which rank first and second in the number of cases, have filled in enforcement detail in 84 percent and 99.5 percent of cases respectively. But the Los Angeles water board, with the third-largest case load, has recorded enforcement detail in just 25 percent of cases.

When asked why so many records were blank, a spokesperson for the Los Angeles board told EWG that older records were less likely to have good data and to rely on records since 1996. But EWG's analysis found that the newer data from the Los Angeles Water Board was even less likely to contain enforcement detail. Analysis of the 2,626 cases that have been closed since 1996 found that only 18 percent of cases provided enforcement details.

Statewide, of the 23,000 cases where enforcement details are recorded, no action was taken in 82.1 percent. Non-binding warnings or other informal notices were issued in 10.3 percent. Binding enforcement action was taken in 7.6 percent of cases; cleanup and abatement orders were issued in just 73 cases; and what the state water board calls "punitive action," the category that includes fines, was applied only 42 times. The exact number and amount of fines is unknown.

This binding enforcement rate may be overly generous considering that nearly all cases (1,705 in 1,758) involved simply issuing an enforceable cleanup order, but do not mean that the issuing agency actually followed up. Both the state and federal audits found that cleanup orders were often not followed up.

Of 16,000 cases still open — that is, where pollution is ongoing — two-thirds were identified before 1995 and one-third before 1990. Hundreds of still-open cases were first reported before 1985.

Regulators offer a variety of excuses for the decade-old sites. One state official told EWG that regulators likely decided that no further action was needed in these cases, but that they had forgotten or failed to change the case to "closed" and no further review was conducted. But the data suggest otherwise. Far from being reported and then dropped from further consideration, a large percentage of decade-old cases have been reviewed (and left open) as recently as 1999. In fact, approximately 40 percent of decade-old cases were reviewed most recently in 1999 and 71 percent have been reviewed since 1995.

About 15,000 of the open and closed leak sites affect water, and about 18,000 affect soil. (Table 7.) Binding enforcement action was taken in about 12 percent of water cases, compared to 5 percent of soil cases. While already-contaminated water is clearly of greater enforcement priority, chemical plumes in soil can spread hundreds of feet in only a few years to nearby wells and aquifers. MTBE not only migrates unusually rapidly but accelerates the spread of other chemicals that also leak from underground fuel tanks, including benzene and tolulene.

Storage tanks owned and operated by 14 major oil companies, or used by independent dealers to store fuels sold by those companies, make up 21 percent of all known sites and 36 percent of all open cases affecting water. San Francisco-based Chevron Corp. is responsible for more than 1,500 cases. Unocal Corp., based in Los Angeles, and Shell Oil Co. are each responsible for more than 1,100 cases.

Table 7.
About 40 percent of leaking sites contaminate water.

Open Sites	Cases
Contaminate Water	8,034
Contaminate Soil	4,947
Contaminate Undefined Area	2,803
Total	**15,784**
Closed Sites	
Contaminate Water	6,436
Contaminate Soil	12,655
Contaminate Undefined Area	1,021
Total	**20,112**
All Sites	
Contaminate Water	14,470
Contaminate Soil	17,602
Contaminate Undefined Area	3,824
Total	**35,896**

Source EWG, from SWRCB LUSTIS, 2000.

MTBE Contaminates Thousands of Sites

MTBE and other gasoline additives known as oxygenates allow fuel to burn more completely, reducing the exhaust emissions that cause air pollution. Amendments to the federal Clean Air Act in 1990 and 1995 required the use of oxygenates in gasoline, and the oil companies rushed to use the cheapest and most readily available chemical — MTBE.

However, evidence that MTBE was hazardous to human health was known at least as early as 1991. Research indicates that MTBE may cause kidney, liver and testicular cancer in laboratory animals, and it breaks down into formaldehyde, a known human carcinogen. (JLAC 1999.)

As early as 1990 regulators in California were aware that MTBE was contaminating drinking water, when tests at the Presidio army base in San Francisco found MTBE in wells at levels 15 times higher than the safety threshold then in effect. It wasn't until 1999 that Gov. Davis signed an executive order to phase out the use of MTBE in gasoline by the year 2002.

The state's database of leaking underground storage tank cases shows extremely high concentrations of MTBE near leaking sites throughout the state. Although the database only records maximum concentrations in monitoring wells near the leak site, as opposed to averages or actual drinking water data, the maximum concentrations indicate the extent of contamination from underground tanks.

Tests for MTBE have been taken in 47 percent, or more than 3,700, of leaking tank cases affecting water. Maximum MTBE concentrations in groundwater exceed the new California health standard (13 parts per billion) at 80 percent of monitored sites. Concentrations exceed the health standard by a factor of 100 at 47 percent of sites and exceed the standard by a factor of 1,000 at 23 percent of sites. (Table 8.)

These results are similar to those produced by a recent Lawrence Livermore National Laboratory analysis of groundwater tests at 236 leaking tanks. Analyzing data submitted voluntarily from five major oil companies, they found that 78 percent reported detectable levels of MTBE. Seventy percent reported MTBE detections above the state safety standard. (LLNL 1998.)

Table 8. Thousands of tank sites are contaminated with MTBE in excess of state safety standards.

County	Sites Above Safety Standard	Sites 100x Safety Standard
Los Angeles	582	392
Orange	347	237
Santa Clara	264	132
San Mateo	226	116
Alameda	203	112
Contra Costa	158	104
San Joaquin	97	44
San Francisco	66	39
Placer	82	53
Sacramento	72	34
Riverside	83	39
Solano	75	44
Marin	54	41
Santa Cruz	58	30
Tulare	30	6
San Bernardino	55	29
Sonoma	45	28
Monterey	48	24
Napa	50	29
El Dorado	36	22
Butte	37	23
Shasta	39	25
San Luis Obispo	38	18
Yolo	32	18
Fresno	13	4
Merced	26	12
Stanislaus	29	15
Nevada	21	13
Tehama	14	7
Yuba	16	10
Inyo	8	4
Lassen	9	4
Tuolumne	9	3
Amador	8	7
Kings	1	0
Colusa	5	4
Lake	3	2
Glenn	7	5
Imperial	7	2
Kern	6	4
Sutter	7	5
Mono	5	2
Ventura	5	4
Calaveras	5	1
Plumas	2	1
Siskiyou	5	4
San Diego	3	2
Mariposa	1	0
Modoc	3	1
San Benito	3	0
Alpine	1	0
Madera	1	0
Total	**3,000**	**1,755**

Source: EWG, from SWRCB LUSTIS, 2000.

Of cases involving major oil companies, no enforcement action was taken in 79.4 percent, informal action in 12.8 percent and binding enforcement action in 7.8 percent. Since 1970, only seven oil company cases have resulted in fines or other punitive action. More than 40 percent of state records on leaking tank cases involving major oil companies provide no enforcement information at all. State and local officials told EWG that fines are inappropriate in the majority of cases because the tank owners did not deliberately violate the law. Under this rationale, all accidental crime, be it speeding, toxic spills, or forgetting to report income to the IRS, would go unpunished.

According to state data, just two cases, both involving Thrifty Oil Co. of Santa Fe Springs, were referred by water boards to a local district attorney for possible prosecution. However, at least two local district attorneys, in Riverside and Orange counties, have *taken their own initiative and won significant penalties from major* oil companies for fraudulently certifying compliance with tank upgrades or other infractions.

While state and regional water quality officials fail to enforce the law, local authorities are prosecuting big polluters for leaking tanks — and winning major penalties.

The Orange County district attorney has been particularly aggressive, winning a $200,000 settlement against the Marriott Corp. in June 2000 and a $1 million settlement against Mobil Oil in 1998. Investigation in the Mobil case discovered that at two-thirds of Mobil stations in Orange County, leak detection devices had been tampered with, allowing leaks to go undetected. (Gottlieb 1998). Orange County, which is also the jurisdiction handling the Thrifty cases, has pending enforcement action against ARCO and Shell Oil for allegedly failing to initiate cleanup at leaking sites.

Some state officials argue that the percentage of open cases is not a good indicator of lack of enforcement due to the possibility that regulators could take punitive action upon closure of the site. A comparison of open and closed cases that impact water, however, shows little difference in recorded enforcement action. For example, regulators took no action or issued only warnings in 90 percent of 3,991 closed water cases vs. 86 percent of 4,911 open water cases. Again, these numbers reflect only cases in which enforcement details are recorded.

4. Methodology

This analysis utilizes the March 28, 2000 update of the Leaking Underground Storage Tank Information System (LUSTIS) compiled by the state Water Resources Control Board. LUSTIS contains detailed records for approximately 36,000 leaking underground storage tank cases. Each of the nine regional board collects the data and the state water board compiles it into LUSTIS. The database records about 50 categories of information about each case, including location, status, enforcement and MTBE tests. A less detailed version of the database is available at www.swrcb.ca.gov/cwphome/lustis/index.html.

Thirteen types of enforcement action are indicated in the database by letter codes. Based on the state's definition of the codes, EWG categorized each case as either no action taken, informal action taken or formal and binding action taken. Informal action includes written warnings. Binding actions include letters of enforcement; cleanup and abatement orders; cease and desist orders; administrative civil liability orders; schedules for *compliance; referrals to a district attorney or attorney general;* petitions from a local agency to the state Water Resources Control Board requesting enforcement action; consent orders; and punitive action taken.

In determining the companies responsible for the leak EWG relied on the name of the site rather than the name of the tank operator. The operator's name is blank in about two-thirds of the records in the database and in most others an individual's name rather than a company is supplied, so listing only the operators would disguise the responsible parties.

Details on payments from the state's underground storage tank fund come from a separate database compiled and provided in April 2000 by the Leaking Underground Storage Tank Fund Program.

Citations

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UST.

L7

Mobil Oil Corporation

3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929

RECEIVED
JUL 1 0 2000
UST CLEANUP FUND

June 30, 2000

State Water Resources Control Board, Regulator
Division of Clean Water Programs
P.O. Box 944212
Sacramento, CA 94244-2120

Re: Permit Modifications

Dear State Water Resources Control Board:

This is a follow-up to our correspondence to you dated December 1999. In that letter we explained as part of the approved merger between Exxon Corporation and Mobil Corporation, forming Exxon Mobil Corporation, Mobil's assets on the West Coast, which include the Torrance refinery, California pipelines, and fuel operations in Arizona, California, and Nevada, were to remain a Held Separate Business until Exxon Mobil Corporation divested certain assets as required by the Federal Trade Commission. We are pleased to announce that ExxonMobil has met these requirements and on June 15, 2000, Mobil's West Coast assets were integrated with ExxonMobil.

At this time we would like to explain to you in more detail the structure of the merger. On November 30, 1999, Mobil Corporation became a wholly-owned subsidiary of Exxon Mobil Corporation. Mobil Oil Corporation and other Mobil companies continue to exist as part of ExxonMobil and continue to own and operate the facilities that they owned and operated prior to the merger. Although we wanted to update you with respect to this integration with ExxonMobil, given that the owner and operator remain the same for Mobil's assets there is no need for any changes to its permits as a result of this event.

If you should have any questions or concerns please do not hesitate to contact us.

Sincerely,
For Mobil Oil Corporation

Glenn M. Sparks	Greg E. Munakata	Darsi M. Meyer
EHS Remediation Manager	EHS Compliance Manager	EHS Compliance Manager
West Region	West Region	Torrance Refinery
ExxonMobil	Stations/Terminals/Pipeline	ExxonMobil
	ExxonMobil	

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JUL 10 2000

Division of Clean Water Programs

ExxonMobil

3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929

July 6, 2000

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
2014 "T" Street
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith:

As follow-up to our meeting on June 28, 2000, ExxonMobil offers the following comments in response to the Notice of Proposed Rulemaking for amendments to the Underground Storage Tank Regulations.

Subsection 2637(a)(1)

This subsection provides an alternative to the secondary containment system testing requirements for those systems that may not be testable because of their inherent design. We strongly support this provision. However, the language is not clear on when the alternative testing must be completed, the required frequency of the alternative test and who makes the determination that a secondary system cannot be tested. Also, the prescribed alternative test would neither be necessary not cost-justified if the owner/operator elects to replace the secondary containment system or implement a permanent test method well before the July 1, 2005 deadline. Therefore, we suggest the following changes:

27-01

- Provide that the alternative test be conducted once with December 31, 2003 as the deadline for completion. If the owner/operator elects to replace the secondary containment system prior to December 31, 2003, the alternative test would not be required.

- Provide that the owner/operator make the determination that a secondary containment system cannot be tested. We believe that it is appropriate for the owner/operator to make this determination based on their unique knowledge gained from the operation and maintenance of the system.

Subsection 2637(a)(2)

It is our understanding that the intent behind this subsection is to allow the local agency to approve an alternative secondary containment test method if there is no applicable test method specified by the manufacturer or specified in an industry code or engineering standard. However, the wording of this subsection may actually allow the local agency to reject these test methods in favor of some other alternative. We recommend that this subsection be modified to clearly indicate that the need for local agency approval applies only if there is no applicable test method specified by the manufacturer or in an industry code or engineering standard.

27-02

Subsection 2636((h)(3)

This subsection as written would potentially prevent an owner/operator from installing any dispenser spill containment or control system unless it has been specifically approved by the Division of Clean Water Programs Underground Storage Tank Program Manager. However, our understanding is that you intend for this provision to apply only to new innovative dispenser containment methods, but not to existing third party approved dispenser containment systems. The language should be modified in this subsection to clarify this distinction between third party approved and new systems. L7-03

Subsection 2640(e)(1)

We request that siphon bars be included in the list of components that are not considered single-walled. L7-04

Subsections 2644.1(a)(1) and (2)

We strongly suggest that the proposed regulation establish a performance-based standard for enhanced leak detection in lieu of the prescriptive requirements in subsections 2644.1(a)(1) and (2). To our knowledge, the only test method that could comply with these requirements is the tracer-based method licensed by Tracer Technologies. Based on ExxonMobil's experience with other tank and line integrity test methods, we believe other test methods could be third party certified to the performance standards in subsection 2644.1(a)(2). Therefore, we recommend that you eliminate subsection 2644.1(a)(1) and retain subsection 2644.1(a)(2) as the performance standard for enhanced leak detection. Establishment of a performance standard will provide more flexibility to industry and encourage the development of less costly alternatives for enhanced leak detection. L7-05

We appreciate this opportunity to submit these comment on the proposed regulations. If you have any questions, please call me at (310) 212-4587

Very truly yours

SR Holm

Stan Holm
Issues Advisor - California

L-8

From: Brian Harmon <bharmon@tait.com>
To: Dave Holtry <holtryd@cwp.swrcb.ca.gov>
Date: 6/9/00 1:51PM
Subject: License requirements for Monitor Certifications under SB989

Hi Dave. Tait Environmental Systems has the following licenses:

A
B
C10
ASB
HAZ
HIC

Our employees are able to conduct work under these licenses. We have secured all of the necessary bonds required by the state.

I have attached an e-mail from CSLB stating that they no longer issue the C-61(D40) license. If the individual conducting the monitor certification has to be licensed this could cause a financial hardship. Some of our employees may not be able to get the license because they can not afford and/or qualify for the bonds that are required. L8-01

I feel that the company, not the employee, should be licensed to do the certifications. As long as the employee maintains the manufacturers certification requirements, and the company maintains the license requirements, the individual should be able to conduct the monitoring system certification. L8-02

Please advise me if this is an acceptable solution.

Brian Harmon
Compliance Specialist
714-560-8222 EXT. 640
714-560-8237 FAX
bharmon@tait.com

S9

problems. Typically, on the installation and typically on the maintenance. And your regulations do not address those issues. If you have any questions, I'd be happy to answer them. Thank you.

MR. SILVA: Thank you. I appreciate your comments. The last blue card is for Carl S. Joberg, L.A. County Department of Public Works.

MR. JOBERG: My name is Carl Joberg with Los Angeles County Department of Public Works. I wasn't originally going to make comments, but since I've heard a few things from comments from the other people that were here. I originally wasn't going to comment on the dispenser issue, but when the gentleman from Edison brought it up, I went back and looked at it and remembered I did have a problem with it.

In that we do have a lot of installations for generators that go directly where the system pumps up to a day tank or maybe directly to the equipment and so forth, where there isn't a dispenser per se. There is no make or break connection to the vehicle or device that is receiving the product. Traditionally, these hav been not even addressed, at least in our jurisdiction as dispensers. S9-04

I am not sure that the definition as you have it in here would necessarily exempt these things. We also have installations of non-motor vehicle fuel tanks. And in the urban area here, we've quite a few of those, where the product is delivered to some process within a building and so forth.

I think that I'm going to look at that definition, where we have direct connections to some equipment using the product or whatever, where is invisible in a work area, and this sort of thing, where we might want to exempt that.

The other comments that I have primary deal with the enhanced monitoring. I know that this is a difficult thing to deal with because of the language in the law itself, and perhaps that's true about this entire array. So you're kind of hand strong, and I appreciate your efforts here to try to get around it, but I have a little problem with the sole source issue, particularly because there really isn't a .05 standard of protocol for testing these methods. #59-08

Because it's a proprietary method it's difficult, plus the fact that it takes place over several days' time. It's difficult for an agency to verify what's going on. #59-05 I think you're also going to have problems with it because even though vent piping and the single wall piping portions of the system are exempt from the need to do this enhanced testing, I don't know that you can get in there, and actually isolate those things. #59-06 So if there are leaks in that system, the tracer-type test, and those who use that technology, are going to show a leak in that system, and then you're not going to know where it is coming from.

The other issue is with regard to approving these systems, where these people are required to submit to us; obviously, we don't know how many we are going to deal with yet because the match up hasn't been made in the database that we furnished to the Board. And I am not sure when we can expect that, but we are going to need some additional capacity in our database, and so forth, in order to react to this.

So as soon as possible that we can receive information, and exactly what kind of information is going to need to be captured, and how we are going to have to report back to The Board, if at all. We need to know so we can start making plans for our system.

59-07

Also I have a little bit of a problem in the secondary containment testing and annual maintenance certification Section 2637(a), where you're asking for an additional test six months after the installation, and 36 months after. And I read in your statement and reasons why you came up with that, I am not sure I agree with that. I think that imposes another inspection, another thing we have to track. That is going to be difficult to do because of the six-month time interval.

We are lucky if we get certifications and all the paperwork in within six months when something is first installed; let alone having to go back out there and get additional tester people.

59-01

The other issue I have is with the 48 hour notification of the local agency requirement for all these various test people are going to do and things

59-03

they are going to do, and it appears in several places in here. Forty-eight hours we get these notifications now, and we say okay fine, and that notification gets tossed in the file, but there are occasions when we do want to observe a test.

And this has come about because of some of the recent expanded inspections that we've been making at some selected sites. And we want to have the ability to override this 48-hour notice business, or whatever time interval. If we feel the need for us to accompany a tester, or a certifier, or somebody, to a site, we want to have the ability to reset that schedule.

259-03

So we don't want people to just announce, "Well, in 48 hours from now we are going to be at "X" place." And we have to rearrange our schedule, and given the size of our operation and the number of tanks that we have to regulate, we want to have the ability for cause, or for some protocol, or some mechanism to extend that period to seek the schedules, that we are employees and our work schedules and things we've already planned and the regulation.

The last thing that I had a comment on is this whole issue of under dispenser containment, the ability to test these things. One of the things we found in these enhanced inspections, where we've actually asked people to dig things up, is that we are finding components that were installed and inspected during installation most likely, but they are not inspectable

259-02

after you install the tanks.

Particularly, I'm talking about flexible couplings, hose clamps, and these source of things that get buried underneath the device. I don't know that there is any real standard for this equipment. Now, we know some manufacturers furnish the clamps with the package that they purchase on the entire containment system, but we don't know that that is a requirement, and we don't know that there is any standard for these things.

There is a lot of different kinds of hose clamps out there. There is a lot of different types of materials that are used for flexible coupling, and how long they will survive buried in the ground, we are not so sure. I don't think any of that can be tested or verified once it's installed.

I think since we are talking about a system of state listing of these devices, in the future I think those components that are buried and can't be observed through visual inspection need to have a very hard look at them as to their survivability and what their life span is.

JS9-03

MR. NeSMITH: Regarding a 48-hour notification of local agency, are you suggesting we extend it beyond 48, or rearrange it so that they ask you when they can perform that activity.

MR. JOBERG: Well, normally, we would waive the requirement, and traditionally we've done that. But

S-10

Mark Taylor from Mosier Brothers.

MR. TAYLOR: Thank you. I am Mark Taylor, Mosier Brothers Storage Tanks in Wooland, California. I grew up in the tank system, and I am currently president of Mosier Brothers. I'd like to comment when manufacture training of installers and triannual secondary containment testing. Section 2635(b)(1) requires installer training that we've heard about. I don't know how much of that, and especially refresher course it's really necessary.

S10-02

Within my working life time, there has only been two real structural changes steel underground storage tanks, single to double wall and some reduced thickness, basically the tank is set on the ground compacted, back filled and so on, the same way today as it has been in three more years. I think it's going to be the same in 30 more years. I imagine it's going to be the same.

Piping and equipment do change and probably do need continuous refresher courses. I don't think the tank is going to change that much. Currently a lot of this instruction is done voluntarily. It's not in my best interest to be part of a bad installation. I think we all work pretty hard to be sure that what's going in the ground is going in correctly, without being a legal requirement.

I'd like to comment on the triannual secondary containment testing or continuous monitoring. I don't think this is really necessary for double walled tank. Mosier Brothers has developed and built the only permanent vacuum monitoring tank in the country. And I think it is correct that vacuum -- to recognize the vacuum or hydro static it's a better tank.

I also would like the chance of basically mentioning The State regulations, I think that would be a real sales aid, but I don't think is absolutely necessary as shown. The vacuum hydro static test, which is probably how other double wall tanks would be tested every three years, test a lot of the tank that really isn't important. A small leak in the secondary at the top it's probably never going to leak fuel. The more common float switch at the bottom is going to be picking up, I believe, the things that are real problems. Thank you.

S10-01

MR. SILVA: Thank you for your comments. Dennis Rock of Dennis D. Rock Construction.

MR. ROCK: Dennis Rock, R-o-c-k. Couple of comments about the under dispenser pin monitoring. I am a little concerned that with this continuous monitoring that the proposal is requiring in trying to retrofit the existing pins that have already been installed, we may be opening up a big can of worms because we have to go in and break the integrity of this pin to install conduit to get the sensor up into the pin, if you do it underground in a nice clean method.

If we do it above ground or over the top of the

MICHAEL SCHUMACHER, Ph.D.
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MIKE SPURGEON
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COUNTY OF ORANGE
HEALTH CARE AGENCY

REGULATORY HEALTH SERVICES
ENVIRONMENTAL HEALTH

211

FAX TO THE FOLLOWING NUMBER: (916) 227-4349

THE FOLLOWING PAGES ARE FOR:

Name of Individual: Charles NcSmith.

Telephone Number:

Firm Name: State Water Resources Control Board

Document(s) Transmitted: UST Proposed Regulations Comments

Comments:

From: Eileen Shepherd / D. Fennessy (714) 667-3768
HCA / Environmental Health Telephone No.

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July 18, 2000

Mr. Charles Nesmith
State Water Resources Control Board
Division of Clean Water Programs
P.O. Box 944212
Sacramento, CA 94244-2120

SUBJECT: Comments Regarding Proposed Amendment to the Underground Storage Tank Regulations

Dear Mr. Nesmith:

Orange County Environmental Health has reviewed the proposed amendments to the underground storage tank regulations. We would like to address the following issues:

- **Section 2636** for the Design Construction, Installation, Testing and Monitoring Requirements for Piping and Under-dispenser Containment. A requirement for under-dispenser containment has been added to this section. In addition to the proposed requirement for under-dispenser containment this Agency feels that fill pipes, vent and vapor lines should be secondarily contained on new construction. L11-02

  It is not uncommon for spill buckets to leak from being jarred loose from traffic, fuel deliveries or not being correctly reinstalled after work on the sump or fill pipe. Vent and vapor lines can contain condensate and have been known to leak. Requiring fill buckets, vent and vapor lines to be secondarily contained would give greater protection to the environment.

- **Section 2637(a)(2)** states, "In lieu of testing in accordance with manufactures guidelines, industry code, or an engineering standard, the <u>local agency</u> may approve the method".

  Allowing local agencies to decide on a test method when there are manufacturers guidelines, etc., may create inconsistencies throughout the state. We recommend that the SWRCB act as the only source for approval of test methods. L11-01

- **Section 2640(e)** states "an owner/operator of a underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well, as notified by the board according to its Geographic Information System mapping database, shall implement a program of enhanced leak detection or monitoring for that tank system in accordance with section 2644.1."

  This section does not clearly define where the 1,000 feet measurement will originate. This section needs to state specifically where at the UST facility the 1,000 feet criteria will be measured. Interpretations by the UST owner/operator and local agency may differ on which site must comply with enhanced leak detection, (i.e., distance drinking water well to property line, tank system, single wall component of the tank system). L11-03

In addition to the previous comments on the proposed regulations, we would also like to address the change in statute regarding annual inspections.

- **Section 25288(a)** of the Health and Safety Code (H&SC) requires annual inspections of UST facilities. This Agency conducts annual UST inspections and we agree with the need to have annual inspections mandated in the H&SC. However, the required elements of the annual inspection are not clearly defined. It has been implied by the SWRCB that in-depth annual inspections should include demonstration of the monitoring system and inspecting the soundness of all tank system components that are visible by opening manways and dispensers. The requirement to conduct an in-depth inspection on an annual basis at each of our 900 UST facilities would greatly increase inspection time possibly requiring additional staff and fees. By clearly defining the elements of an in-depth inspection within Title 23, the need for additional fees and staff could be demonstrated. L11-04

  We feel that the in-depth inspection should be required at a minimum of every 2 years. This would allow local agencies to conduct an in-depth inspection on an annual basis if needed. Additionally, this Agency feels that it is important to conduct unannounced inspections to ensure that the facility is in compliance with the UST laws and regulations.

  On alternate years, an annual on-site inspection would confirm that paperwork is current and required testing and monitoring is being properly done. The SWRCB could define minimum requirements for the inspections on the alternative years.

Thank you for considering these comments. If you have any questions please call me at (714) 667-3780.

Sincerely,

Denise Fennessy

SW

Denise Fennessy
Program Manager
Environmental Health Division

S-12

process in the rule, or the law, for us to appeal a local agency decision to The State Board staff.

MS. FARAHNAK: I think it would be very helpful for me to respond to the comments, if you have a better idea as far as the dispensing part of your facility in order to -- if you provide The State Board with a better description of the design at your facility.

MR. KAY: You mean in terms of submitting these comments?

MS. FARAHNAK: Yes, later.

MR. KAY: As part of the comments.

MS. FARAHNAK: As part of the comments, or as a follow-up document, in order for us to evaluate that comment relating to dispenser containment docs. We need to have a better understanding of how your facility is put together.

MR. KAY: We would be happy to do that.

MR. NeSMITH: Constructive pressure diagram would be fine.

MR. KAY: Thank you.

MR. SILVA: Thank you, Mr. Kay. Next is James Weckerle, Pasadena Fire Department.

MR. WECKERLE: Thank you. My last name is Weckerle, W-e-c-k-e-r-l-e. I am with the Pasadena Fire Department. I'm the hazardous material specialist for our department. I ran all of our environmental programs. Well, it seems like much of the comments today has taken place regarding the materials involved

S12-01

in making tanks, and how we monitor those tanks.

It seems like we are missing a grand opportunity here today to solve one of the biggest problems that I see in the underground storage tank industry. Number one, performance indicator of an underground storage tank system is the quality of the installation and maintenance on that system.

What we see in the regulations today is a continuous in our reliance on the manufacturer's to train and certify the individuals involved in using their materials, and unfortunately that is not performed to a manner that I believe most regulators would have liked in the past, given the history of our underground storage tank tester program.

While there are many, many good testors out there, there are also many, many testers, who do not understand the equipment. Do not understand the limitations, and do not understand the regulations involved. They follow a checklist, and if the tank system that's involved doesn't fit the perimeters for which that tank checklist was developed, they miss the ball.

Similarly, the contractors license, while there are many, many good contractors out there, being in the fire prevention division of our fire department, I also see daily, contractors who do not understand what they are doing, and do not understand the regulations. And it causes problems for both the regulated community and

SK-01

the regulators.

We have an opportunity here to improve those programs, I believe, at least for those stations that are within a thousand feet of the public drinking water wells, if not the entire regulating community. I believe that The State Board needs to impose additional quality control and quality assurance matters or procedures on the training of these individuals, who will be installing and testing and maintaining these systems.

Manufacturer's training programs are necessary, but those training programs need to be monitored and approved by The State Board, so that we can ensure that there is some actual training going on; and there is some information transfer beyond merely here's a checklist, follow the checklist. Not all stations are cookie cutters.

5|2-01

Not all geology fits a certain profile. It's the exceptions and the exemptions and the differences that kill us. And if we have people who simply follow a checklist with no assurance that there is an actual information transfer and an understanding that goes along. We are fooling ourselves if we think that adding additional processes to monitor the equipment that we have in there is going to make a difference because where we see the leaks is not related to material failure.

Where we see leaks are due to workmanship

L-13

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance
California State Contractors License No. 630936 • Classification: General Engineering A - C61/D40 HAZ
18305 LAKE CHABOT ROAD • CASTRO VALLEY, CA 94546 • PHONE / FAX (510) 889-7888

FACSIMILE

Date: 7·18·00

To: CHARLES NESMITH
STATE WATER RESOURCES CONTROL BOARD · DIV. OF CLEAN WATER PROGRAMS

From: Jack Bail

Phone: (510) 889-7888

(510) 889-7888

Phone: (916) 227-4377

Fax: (916) 227-4349

Total number of pages sent including this one: 3

PUBLIC HEARING COMMENTS ON PROPOSED AMENDMENTS TO UST REGULATION

Message:

PLEASE INCLUDE THIS LETTER TO RECORDS OF HEARING SCHEDULED THIS MORNING IN ALHAMBRA @ 10:30 AM. I WILL FORWARD ORIGINAL, SIGNED LETTER IN TODAY'S MAIL TO YOUR OFFICE.

THANK YOU,

Jack

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance

California State Contractors License No. 630936 - Classification: General Engineering A - C61/D40 HAZ

July 17, 2000

Mr. Charles NeSmith
State Water Resources Control Board - Division of Clean Water Programs
2014 "T" Street - P.O. Box 944212
Sacramento, California 94244-2120

Re: Regarding Proposed Amendments to the Underground Storage Tank Regulations
Public Hearing scheduled for Tuesday July 18, 2000 at 10:00 a.m.
County of Los Angeles Department of Public Works, 900 S. Fremont Ave., Alhambra, CA

Dear Mr. NeSmith,

Please include this letter into records of the meeting indicated above as my statement regarding proposed regulations to *amend and add new sections, in Title 23, Division 3*, Chapter 16 of the California Code of Regulations (CCR), needed to implement Health and Safety Code (HSC) sections 25284.1 and 25294.4.

My concern lies specifically with Section 2637. Secondary Containment Testing and Annual Maintenance Certification. Subsections 2637(b)(1)(B) and (C), my questions and suggestions are as follows:

Are certification training programs offered by or available from all monitoring system manufacturers? L13-01

If so, is January 1, 2002 the deadline by which the installer or maintenance technician must be certified? L13-02

What about other related tank, piping, dispensing equipment manufacturers certification program availability? L13-03

After having to enlist the services of another firm (competitor) certified by the manufacturer as required by local regulatory agency, to perform the initial startup and testing of monitoring system on site of our client's new UST installation project. Followed by an inquiry made through a local distributor, to the manufacturer of the monitoring system we often purchase and install for many of our clients, requesting information about any training programs they might offer or that we could attend in order to obtain the necessary certification and authorization for the installation, service, etc., of monitoring equipment that we were providing.
I was informed that *this manufacturer (with product marketing focused more on Oil Company retail affiliates* than commercial facilities), accepted personnel for certification training from only those companies which had initially been requested by the Oil Company or Jobber to service and maintain their equipment, and as a "certified" manufacturer's Authorized Service Representative, must provide 24 hour maintenance service. L13-04

Therefore, I would suggest that the amendment include requiring:

That all manufacturers of regulatory approved monitoring system equipment and related components, **must** *offer or make available, system certification training* without bias or unfair requirements as a condition of their authorization or approval, to any company properly licensed and qualified to provide these services.

Continued,

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Complete Fueling Systems Installation & Maintenance

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We're a small company, specializing in new installation of UST and AST fuel dispensing and monitoring systems, providing preventative maintenance services, including annual functional testing of leak monitoring equipment and related components, in addition to necessary upgrades and removal of existing systems. Our clients are exclusively commercial or private businesses, we do not have the personnel or resources available that would enable us to provide our services to Oil Company or Jobber affiliated service stations.

If the amendment is adopted as written under the proposed text, it could allow manufacturers of the monitoring equipment basic control of deciding which companies, will (or will not) receive necessary certification training and authorization required to provide services for the installation, testing, maintenance, calibration, repair, or replacement of their monitoring equipment and components.

I feel our company and others like it would share an unfair disadvantage in attaining the necessary authorization and required certification. In turn forcing our clients to seek other companies for services we are fully qualified to perform and currently provide for our clients, in addition would signiificantly reduce current income earning potential and severely inhibit any future business growth.

Thank you for your time and I appreciate your consideration on this issue.

Sincerely,

Jack Bail, President

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L14

think this is really necessary for double walled tank. Mosier Brothers has developed and built the only permanent vacuum monitoring tank in the country. And I think it is correct that vacuum -- to recognize the vacuum or hydro static it's a better tank.

I also would like the chance of basically mentioning The State regulations, I think that would be a real sales aid, but I don't think is absolutely necessary as shown. The vacuum hydro static test, which is probably how other double wall tanks would be tested every three years, test a lot of the tank that really isn't important. A small leak in the secondary at the top it's probably never going to leak fuel. The more common float switch at the bottom is going to be picking up, I believe, the things that are real problems. Thank you.

MR. SILVA: Thank you for your comments. Dennis Rock of Dennis D. Rock Construction.

MR. ROCK: Dennis Rock, R-o-c-k. Couple of comments about the under dispenser pin monitoring. I am a little concerned that with this continuous monitoring that the proposal is requiring in trying to retrofit the existing pins that have already been installed, we may be opening up a big can of worms because we have to go in and break the integrity of this pin to install conduit to get the sensor up into the pin, if you do it underground in a nice clean method.

L14-01

If we do it above ground or over the top of the

island, we may raise other issues as to client safety A.D.A. compliance of this nature. The full system that is predominately used in most of the pin is, if maintained, and I have to put that in there, by the owner operator of the station is more than adequate to recognize any leaks that occur within the dispenser or the pump system.

And to trip the shear belt, which shuts off the flow of product. Once the flow of product is off, and there is no more pressure on the dispensing system, via the bottom site of the pump, or the actual dispenser, if it's a subunit, you got no more leak. Another issue that we are faced with is that the pins are designed in such a manner that the flow sets below the bottom level of the pan.

L14-01

And this little containment fills up and trips and makes the float rise. Any kind of a float sensor that is added is going to be above that level, so the shear valve is going to be tripped, the product flow will be shut off long before the product level gets high enough to engage that float sensor, so that it will do the audible visual program that's in the proposal.

So it's kind of a redundant spending of lots of dollars that aren't going to accomplish anything on benefit -- to the benefit of the environment or the guy that's paying the check, actually, in the interim; because there is a lot of people out there that brought their systems into compliance within the last 12 to 18 months before the deadline.

Now, we have to go back to them, and say, "Well all that concrete that we put in, it's all got to come out. We have to add more conduit. We have to put another sensor in each one of your pins." And now we run into a problem of do we have a monitor that has the capacity to handle the additional sensors. He may or he may not have that style of monitor.

So now he's going to spend more dollars to enlarge the size of the monitor. So it just keeps getting to be a larger and larger problem, and it doesn't really accomplish anything that hasn't been already taken into consideration by the float switch itself.

L14-01

You'd mentioned about the hydrostatic test, and the way the exception is written in the regulation, if I am understanding it correctly, any type of a sensor that would recognize in the double wall tank system intrusion of ground water from the outside into the inner space or intrusion of product from the primary to the secondary, would exempt that tank from your triannual testing of the triannual test; is that correct?

L14-02

MR. NeSMITH: The exception is set up --

MR. ROCK: And you've got it written in such a manner that you only use those two examples of hydrostatic --

MR. NeSMITH: Those are just examples. There are other systems --

2515

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EDISON

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To: Charles NeSmith Date: 7/18/00

Company: SWRCB

FAX No: (916) 227-4349

From: David Kay Pages: 3

Phone No: 626/302-2149

Message: Written comments on SB 989 regs.

David Kay

SOUTHERN CALIFORNIA
EDISON
EDISON INTERNATIONAL Company

July 18, 2000

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
2014 T Street
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith:

SUBJECT: COMMENTS ON PROPOSED RULEMAKING TO IMPLEMENT SB 989

Southern California Edison Company (SCE) appreciates the opportunity to comment on the proposed underground storage tank (UST) regulations to implement SB 989. SCE owns and operates the San Onofre Nuclear Generating Station (SONGS) near San Clemente, California. SONGS is a 2,200 megawatt nuclear-fueled generating station. The station employs emergency diesel-powered electric generators, as required by the federal Nuclear Regulatory Commission (NRC), to ensure safe operation of the facility in the event of an electrical power failure to safety-related station control systems. The generators are supplied by four 50,000 gallon underground diesel fuel storage tanks. These tanks are plumbed directly to the generators through valves, pumps and piping.

L15-01

The proposed regulations, like the legislation which mandates them, are not drafted with a nuclear powerplant in mind, but rather the thousands of motor vehicle fueling stations and other facilities in the state which employ underground fuel storage tanks. In order to avoid any confusion or misinterpretation of these regulations by the local implementing agency, we believe the rules should clearly exempt our emergency generator fuel tanks from the proposed requirements. Our experience has been that the local implementing agency is extremely conservative about interpreting the UST rules and this has resulted in very high compliance costs with no apparent environmental protection benefit.

The U.S. EPA deliberately exempted from federal UST regulations any tanks serving emergency generators at NRC-regulated facilities (see 40 CFR 280.10(c)(3)), recognizing that NRC requirements and oversight afford adequate environmental protection. We urge you to adopt this federal deferral, as have 48 other states, by amending the definition of "motor vehicle fuel tank" in Section 2611, as follows"

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> "Motor vehicle fuel tank" means an underground storage tank that contains a petroleum product. The definition does not include underground storage tanks that contain used oil~~.~~, or any underground storage tank or tank system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR part 50, appendix A.

The proposed definition of "dispenser" should also be clarified such that it may not be misinterpreted to include emergency generator fuel delivery systems which are not designed to be disconnected or reconnected, as would be the case for vehicle fueling, or dispensing fuel from the tank to another container. We propose that you modify this definition as follows:

> "Dispenser" means an aboveground or underground device connected to underground storage tank piping that is used for the delivery of a hazardous substance from the underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein. Dispenser does not include permanent piping and delivery systems between an underground storage tank and an emergency electrical generator where such piping and delivery systems are not designed and constructed to be disconnected from the generator.

L15-02

We look forward to working with your staff to finalize these regulations. Please call me at (626) 302-2149 if you have any questions.

Sincerely,

DAVID W. KAY, D.Env.
Project Manager, Environmental Affairs

LS15

What I want to discuss today are the 450 thousand gallon diesel underground storage tanks at the San Onofre nuclear generating station, which provide fuel for the emergency power generators at that facility. And those generators allow the nuclear plant to be brought down to a safe shutdown in the event of a total power loss on the grid.

The underground storage tank rules obviously were not intended for those tanks. They were intended for gasoline station tanks and other factory hazardous material underground storage tanks. It's been very difficult getting special consideration from our local agency for matters regarding compliance with these rules for those four tanks.

LS15-01

With all due respect to CUPA, San Diego county, and the sister agencies here. They have been very, very conservative in interpreting these rules to their credit, but to our detriment it has been very, very difficult and in some cases very, very expensive complying. Now, we are concerned that these under dispenser containment rules may cause, as it has in the past, a future heartache in terms of compliance, and in dealing with our CUPA.

There is a simple remedy for this, which perhaps we should have tried to get written into the original law back in the '80s, but we did not. And that was the change in the definition of motor vehicle fuel tank, as it currently appears in the regulations. I would suggest simply that we add to the definition for motor vehicle fuel tank.

This definition does not include underground tanks and piping serving emergency generators at nuclear fuel power plants regulated by the US Neutral Regulatory Commission. That exception would apply to only two facilities in California, San Onofre and PG&E's Diablo Canyon power plant. Alternatively, you could add specific exceptions to the under dispenser containment regulation.

For example, you could add a section 2636(H)(4). That would read on the order of under dispenser containment is not required for fuel delivery systems of emergency generators at nuclear fuel electric generating stations. Regulated by the Federal Nuclear Regulatory Commission. And similarly for the proposed regulations for enhanced leak detection, you would add a similar exemption, a new section 2640(f). That would read, the requirements of Section 2640(e) shall not apply to tank or fuel delivery systems of emergency generators at nuclear field electric generating stations regulated by the Federal Nuclear Regulatory Commission. 2515-02

I know this sounds like a special exemption just for our facility. It is. This is not a corner gas station, and the tanks are not gasoline storage tanks. Nuclear Regulatory Commission imposes very, very strict requirements on Edison for the operation, maintenance and monitoring of those tanks. If the facility is designed to withstand a terrorist attack and a direct hit by a 747, certainly our underground storage tanks are protective of their environment.

Thank you for the opportunity to comment, and look forward to working with you in the future to draft these books.

MS. FARAHNAK: I have a question. I am very familiar with your facility, and I believe those are the tanks that there were discussions with --

MR. KAY: Yes. And they have been lined.

MS. FARAHNAK: Okay. I was curious. My understanding was these tanks were for the purpose of emergency generators, and you mentioned dispenser under dispenser plan?

MR. KAY: That's correct. They are hard piped to the diesel generators. There is no dispenser, such that you would see at a gasoline station.

MS. FARAHNAK: Okay. So that's why my question was in order for us to be able to respond to the comments, I wasn't sure how the under dispenser requirement would even apply to those facilities.

MR. KAY: Well, certainly, in my opinion, the under dispenser requirement would not apply to those facilities, but stranger things have happened in dealing with local agencies interpreting State regulations, particularly when the local agencies are given very little or no authority to grant exemptions or some wiggle room into the rules. And there is no formal

AS 16

didn't have those, or I can just go ahead and consider those comments as being submitted now.

MR. WHITE: Okay. I certainly will.

MR. SILVA: Thank you.

MR. WHITE: Thank you.

MR. SILVA: Mr. Stan Brodecki, SPC.

MR. BRODECKI: I am Stan Brodecki. I work for SPC, which is the parent company of PacBell, Southwestern Bell, Meritech, and Southern New England Bell about 13 states. And I am in San Ramon, California. And I have about six to eight hundred underground storage tanks, only which about 100 of them contain gasoline, and I understand the dispenser requirement for the gasoline tanks.

L16-02

And the way I've read the regulations and have read it for many years is that emergency generators because they don't have dispensers cannot have a dispenser tank. It's just not there. It won't fit. So I assumed that that was already not applicable to emergency generators.

I do have a question on the secondary testing, and it's a little bit of gray area for me, and I understand we can test the secondary containment of the piping. And we can probably test the sumps, by maybe fill them with water, et cetera, but the secondary containment of say a double wall steel or fiberglass tank that is full of product, is kind of hard to test. In the fact that you can't put a pressure test on it

L16-01

because you've got product in the tank.

And even if you were to remove all the product from the tank you'd have to thoroughly clean it, especially it's gasoline before you want to put any pressure 'cause you got a gigantic bomb sitting there. So you're looking at trying to test the secondary containment of the tank that has product in it, and you can't put pressure.

And about the only method I can think of right now would be possibly vacuum to the secondary containment. And I don't know of a particular testing company myself that can pull a vacuum on the secondary containment that has gone through third party certification for the point one gallon per hour plus the 95 percent rule, but if you guys know of one I'd appreciate that, but I am concerned on how we are actually going to test the secondary containment of the UST itself, not the piping or anything else.

And then of course, you also say that in five years, I have to make this system testable, if I use enhance leak detection plan, so but then again without having removed the tank we're putting something totally different. How am I going to do that.

2160

MR. SILVA: Thank you. That's the last of the speakers. Let's again, anybody else that wishes to speak today, please if you are interested do it now, since we are going to close the hearing. Seeing nobody, what I'd like to do is have the staff go through --

STEEL TANK INSTITUTE

LS-17

July 11, 2000

Mr. Charles NeSmith
California State Water Resources Control Board
Division of Clean Water Programs
2014 T Street
PO Box 944212
Sacramento, CA 94244-2120

RE: Amendments for Implementation of SB 989 to Underground Storage Tank Regulations – Title 23, Division 3, Chapter 16, CCR

Ladies and Gentlemen:

The Steel Tank Institute is an international non-for–profit trade association representing over 100 shops that build underground and aboveground steel storage tanks. STI develops standards for the fabrication and installation of state-of-the-art underground and aboveground shop fabricated steel storage tanks.

STI wishes to comment specifically on section 2637 of the Amendments for Implementation of SB 989 to the California Underground Storage Tank Regulations – Title 23, Division 3, Chapter 16, CCR. Section 2637 requires that all secondary containment of underground storage tank systems installed before January 1, 2001 be periodically tightness tested. For those systems that cannot be tested, an enhanced third party certified leak detection system, when approved by the local agency, can be used until July 1, 2005. At that time, the secondary containment system must be replaced with a system that can be tested every 3 years.

Secondary containment of steel storage tanks has been supplied in various forms since the introduction of secondary containment in the early 1980s. Since standards and installation practices have evolved since that time, the ability to test the containment will require some understanding of the type of tank system in the ground and will require an understanding of how the tank was installed. Ultimately, testing the secondary tank containment will entail a considerable cost to the owner/operator to test the containment. LS17-01

Initially, double wall steel tanks were built to contain 110% of the capacity of the

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primary tank. The outer wall of such tanks was built similar to aboveground storage tank specifications. The fabricator shipped the tank with an interstitial monitoring pipe, external to the tank heads, that terminated at the top of the tank. These tanks can be tested with 3-5 psi air pressure, but vacuum testing would not be a recommended practice without individual tank structural analysis in its buried condition.

In 1984, the Steel Tank Institute developed the nation's first national standard for secondary containment tanks. About a year later, UL introduced secondary containment into its UL 58 tank standard.

STI entitled its standard the Dual Wall Tank Standard. The steel secondary containment shell was wrapped directly over the primary tank and typically provided 100% containment. The volume of the interstice is very small. However, the space is large enough to allow any release of stored liquid or to allow any intrusion of groundwater to travel to a monitoring pipe. The monitoring pipe was normally extended to the top of the tank, external to the tank head, by the fabricator, to enable the tank to be shipped to the site.

According to the Standard, the monitoring of the interstitial space could be accomplished by one or more of the following methods:

- Regular sticking
- Electronic monitoring (constant)
- Mechanical (float devices)
- Pressure or vacuum.

The flexibility given to leak detection monitoring was intentional. It enabled innovative forms of technology to be developed to detect releases. It also enabled release detection systems to be developed that could monitor not only the tanks, but other components also.

STI Members use a third party insurance carrier to oversee a national warranty program on several significant types of underground steel storage tank technology. With over 60,000 secondary containment tanks in the database; there have been no reported incidents of a release from any primary tank into groundwater with STI labeled secondary containment tanks. Most of these tanks were built to the STI Dual Wall Tank Standard, UL 58, and/or UL 1746 Part III for jacketed tanks.

Again, these tanks were shipped with the interstitial monitoring port flush with the tank top. This provided flexibility to the owners/operators/installers to place various forms of release detection equipment into the interstice. As an end result, there is a wide variety of secondary containment tank systems in place.

Some STI Members estimate that 25% to 50% of the existing tanks will require some additional work in order to perform the test required by Section 2637. For example, not all installers extended the monitoring pipe to grade. Instead, the leak detection device was mounted directly into the monitoring pipe supplied by the fabricator - located flush with the tank top and several feet below grade. Keep in mind that many of these tanks were installed before or at the advent of sumps. Sumps were installed over the top of the tank, to contain tank accessories. It was not until the early to mid 1990s that UL accepted secondary containment monitoring pipes to be installed inside the tank, where the monitoring port could be made accessible within a sump.

Thus, in order to test the tank's secondary containment, the owner/operator may need to hire a contractor to cut through the concrete and dig to the top of each tank in order to access the interstice. For those systems in which the contractor extended the monitoring pipe to grade, such extensions were made liquid tight, but may not be pressure or vacuum testable without additional work being required. This can have an impact on the tank owner's operations and will certainly generate some expense in order to meet the rule.

This issue is not limited to steel tanks only. Non-metallic tanks also relied on monitoring probes for release detection of the interstice until only recently.

During the past decade, we have seen additional changes to the construction of steel secondary containment tanks. After UL published its UL 1746 Standard in 1989, jacketed tanks became a common type of construction for the steel industry. Jacketed tanks used some sort of plastic outer containment that also acted as a corrosion control barrier. The most common material for the steel tank jacket is FRP.

Most jacketed tanks today are shipped with a vacuum in the interstice. The monitoring port is usually accessible within a tank sump. Usually the vacuum is released upon completion of installation and again, various forms of release detection can be installed. With these most recent installations, there should not be a significant hardship to access the interstice. Yet, there will still be an expense to hire a contractor to perform a vacuum test. Based on the performance history of STI labeled tanks, STI questions the need for such regular 3-year testing of the outer tank containment to take place.

Section 2637 (2) states that secondary containment systems must be tested either in accordance with manufacturer's guideline or instructions or by an industry code or engineering standard.

STI wishes to point out that the 1996 Edition of the NFPA 30 Flammable and Combustible Liquids Code has language mandating the tightness testing of the interstitial space of underground secondary containment tanks prior to placing the tank in service. It states that "the interstitial space of such tanks shall be tested either hydrostatically or with air pressure at 3 psig to 5 psig or vacuum at 5.3" Hg or in accordance with the listing or the manufacturer's instructions. The pressure or vacuum shall be held for one hour."

We recommend that secondary contained steel tanks built to the STI Dual Wall Tank Standard, the UL 58 Type 1 secondary containment tank, or to the UL 1746 requirements for jacketed tanks can be vacuum tested in accordance with the NFPA 30 Standard. Steel tanks with 110% containment can be tested with air, but with no more than 3 psig, with the approval of the original tank manufacturer.

Section 2637(6) of the proposed regulation exempts periodic secondary containment testing where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum.

STI feels that a vacuum or pressure system has a greater sensitivity in detecting a release than a hydrostatic system, but we notice that there is no criteria to evaluate such systems. For example, some hydrostatic systems rely on visual examination of a chamber filled with liquid, installed within a sump, to determine if a release has occurred. Similarly, a pressure gauge could be mounted within a sump to provide indication that a pressure or vacuum is maintained within the interstice. Both methods rely on the owner/operator to visually inspect the equipment on a regular basis. There is no requirement of an alarm or any other device to detect leaks on a *continuous* basis in this section.

In conclusion, STI would like to summarize its primary comments.

- Existing secondary contained steel tanks in California have various construction features.
- Access to the interstitial monitoring port of the tank will cause an inconvenience and expense to the system owner/operator.
- The performance of STI labeled secondary containment tanks with various forms of release detection equipment suggests that testing the containment every three years is not necessary for safeguarding human health and the environment.
- The NFPA 30 Standard gives excellent guidance for testing secondary contained underground storage tanks.
- Relying on visual examination of "continuous" monitoring systems may not provide the equivalent results desired by California agencies.

Yours truly,

Wayne Geyer

Wayne Geyer
Executive Vice-President

Steel Tank Institute

Standard for Dual Wall Underground Steel Storage Tanks

F841-91

STI documents are updated from time to time. Contact STI for the latest version.

PREFACE
The Steel Tank Institute (STI), formed in 1916, is a not-for-profit organization whose purpose is to secure co-operative action in advancing by all lawful means the common purposes of its members and to promote activities designed to enable the industry to conduct itself with the greatest economy and efficiency. It is further the purpose of STI to cooperate with other industries, organizations and government bodies in the development of reliable standards which advance industry manufacturing techniques to solve market-related problems.

This standard for dual wall tank construction is based on the application of sound engineering principles and the combined experience of STI membership, which includes state-of-the-art manufacturing considerations. It represents a composite of data from users, manufacturers, regulatory authorities and consultants.

1.0 SCOPE

1.1. The standard addresses underground double containment (atmospheric-type) vessels with built-in monitoring capability for the purpose of giving advance notice to avoid environmental contamination. The primary intent of this standard is to address the petroleum storage segment, although other products, including hazardous chemicals, can be covered by this standard. It should be noted that certain products and chemicals will require 360° double wall containment.

1.2. Dual wall tanks are defined as tanks patterned after Underwriters Laboratories Standard UL-58, that have an additional outer steel wrap which is self contained, impervious to liquids and can envelope the entire circumference.

1.3. This standard addresses the manufacture, inspection and testing of dual wall tanks prior to shipment. These tanks are to be installed in accordance with the manufacturer's recommendations, and NFPA 30, NFPA 30A, NFPA 31 or local requirements.

2.0 DESIGN CRITERIA

2.1. Inner Tank. The primary tank (including pipe connections, manholes, etc.) shall be constructed in strict accordance with UL-58, with the following exceptions:

> **2.1.1.** The length to diameter ratio shall not exceed 5:1.
> **2.1.2.** Flat, unflanged heads are not permitted.
> **2.1.3.** Stainless Steel tanks must be totally contained within carbon steel outer wrap. All welds connecting carbon steel to stainless steel shall be made with appropriate materials to prevent contamination such as type 309 or 310 (or L designated) welding electrodes.

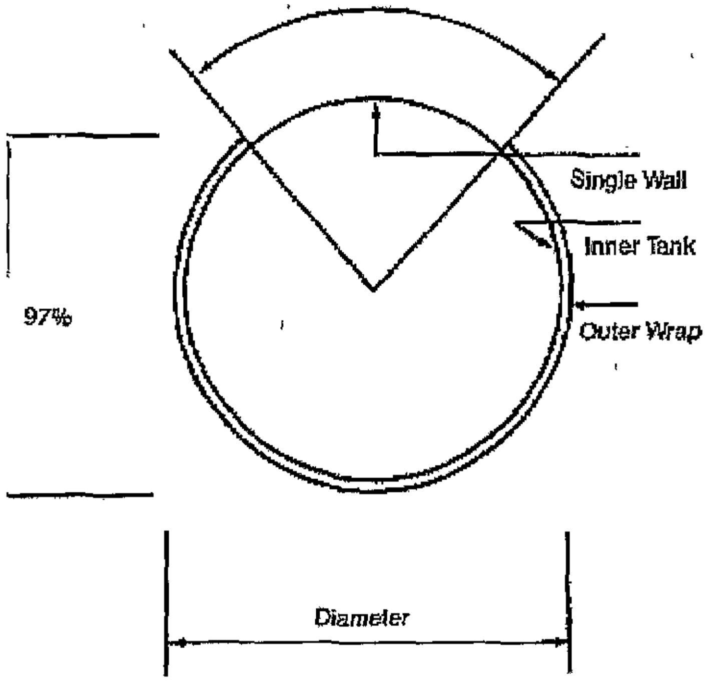


FIGURE 1
COMMON DUAL WALL DESIGN
WITH 300° OUTER TANK WRAP

2.2. Outer Wrap. Construction of the dual wall (outer wrap) shall be separate, but intimate, contact or face-to-face layup. Complete welding of the outer wrap to the inner tank shall be only at the upper perimeter of the outer wrap where it is joined to make the secondary containment air/liquid tight. Tack welding of outer wrap to primary tank for fit-up purposes is acceptable as long as such welds do not interfere with the tank's monitoring capabilities for release detection.

3.0 CAPACITIES, DIMENSIONS, MATERIALS

3.1. Inner Tank. The inner tank shall be designed and comply with paragraph 2.1 of this standard.

3.2. Outer Wrap.

3.2.1. The outer wrap material shall comply with UL-58.
3.2.2. The outer wrap material thickness shall be in accordance with Table 1.
3.2.3. The exterior shell may or may not wrap the full 360° circumference of the primary tank. For instance, a 300° wrap will contain approximately 97% of total tank volume. See Figure 1 [above].
3.2.4. For 360° containment, all welds connecting pipe, fittings, and manholes to the inner tank, shall be contained within the other wrap.

TABLE 1
Nominal Material Thickness - Type 1 Dual Wall Tank Construction

Maximum Diameter		Outer Wrap (a)	
Inches	Meters	Shell	Head (b)
42	1.07	.135	.135
48	1.22	.135	.135
64	1.63	.135	.135
84	2.13	.135	.179
96	2.44	.135	.179
126	3.20	.179	.250
144	3.66	.179	.250
144	3.66	.179	.250

a) Nominal material thicknesses are subject to gage thickness as established within UL-58.
b) Figure 4, Type C outer tanks heads must meet UL-58 requirements
c) The primary tank shall be constructed with material thickness established within UL-58. However, all tanks shall be minimum 10 gage. The inner tank head shall conform to UL-58 bulkhead requirements when the outer tank is fabricated with extended heads, as indicated in Figure 4, Type C.

4.0 SEAMS, JOINTS

4.1. Inner Tank. All shell seams and head joints shall comply with UL-58.

4.2. Outer Wrap.

> **4.2.1.** All shell seams on the outer wrap shall be in accordance with Figure 2.
> **4.2.2.** All head joints on the outer wrap shall be in accordance with Figure 3.
> **4.2.3.** Flat, unflanged heads are not permitted.

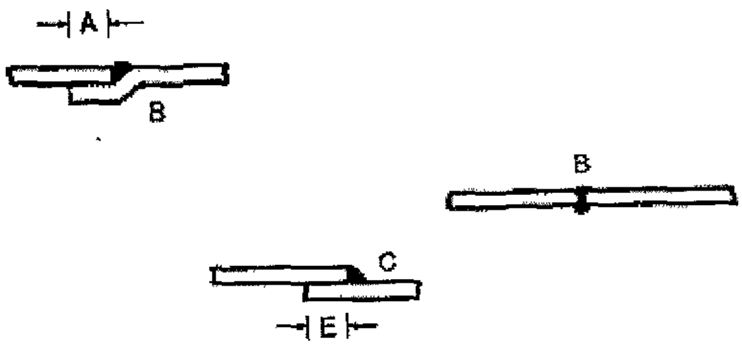
5.0 LIFT LUGS

5.1. Each lift lug must be designed to support the total weight of the dual wall tank.

5.2. Gross weight for the dual wall tank shall be clearly marked on each exterior tank head.

6.0 MONITOR WELL

FIGURE 2
OUTER WRAP SHELL SEAMS



A. Overlap-½" (12.7) Minimum
B. Continuous Weld
C. Continuous Full Fillet Weld
E. Overlap-¾" for Tank Diameter over 48"
½" for All Other Tanks

6.1. The dual wall tank shall incorporate a monitoring well capable of adapting to the monitoring method and system specified. Figure 4 illustrates some acceptable monitoring construction methods.

6.2 The design of the system must allow for monitoring of the interstitial space.

6.3 External monitoring well pipe and fittings shall be attached to the tank in such a manner so as not to affect structural integrity of the tank.

7.0 MONITORING INTERSTITIAL SPACE

7.1. Monitoring of the interstitial space as required in 6.2 can be accomplished by one or more of the following methods:

7.1.1. Regular sticking.
7.1.2. Electronic monitoring (constant).
7.1.3. Mechanical (float devises).
7.1.4. Pressure or vacuum. (If pressure is used, care should be taken to assure that pressure will not damage the tank.)

8.0 STRIKER PLATES

8.1. Striker plates shall be installed under all openings.

9.0 CORROSION PROTECTION

9.1. The exterior of the dual wall tank shall be protected from external corrosion in accordance with NFPA 30.

9.2. Auxilliary leak detection equipment shall be electrically isolated from the steel tank structure.

10. TESTING

10.1 The inner tank as well as the interstitial space of the double wall tank shall be tested prior to shipment in the following manner:

10.1.1. Upon completion of the inner tank and before applying the outer wrap, the tank shall be tested in accordance with UL-58.

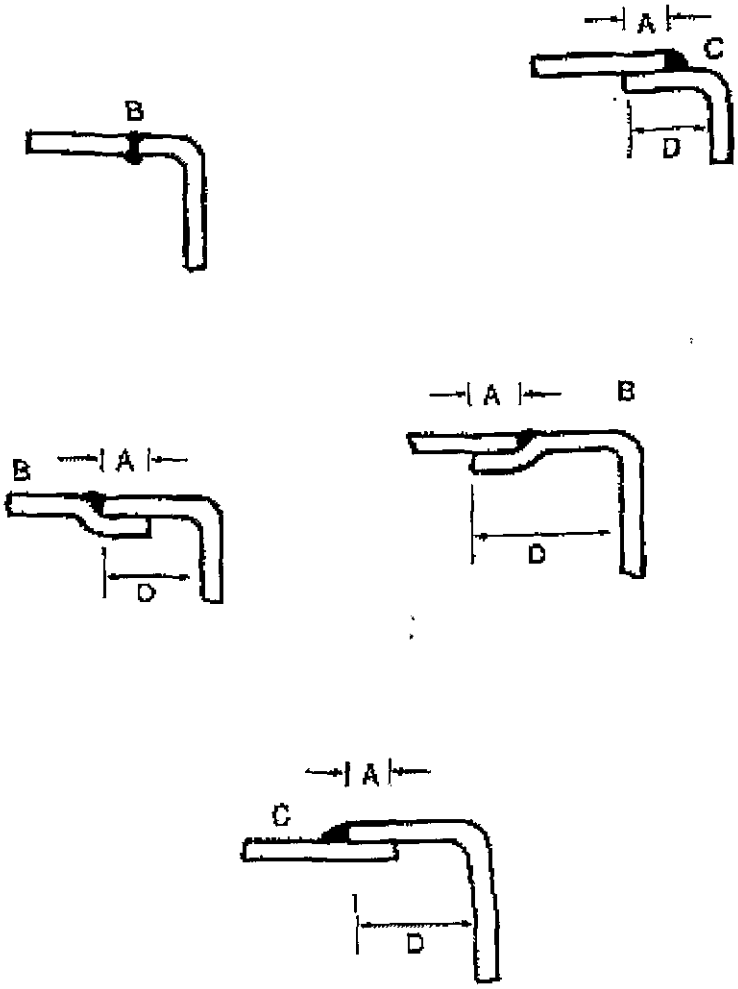
10.1.2. Upon completion of the double wall construction, the tank shall be tested as follows:

10.1.2.1. The inner tank shall be tested at a maximum internal pressure of 5 pounds per square inch (psig).
10.1.2.2. While maintaining this pressure on the inner tank, the outer wrap shall be tested at a maximum 5 psig in the interstitial space. Pressurize the interstice with air from the primary tank to avoid overpressurization of the interstice.
10.1.2.3. All visible seams and welds are to be covered by soap solution or equivalent material for the detection of leaks.

10.1.3. In addition, the interstice of all dual wall tanks without extended heads can be tested with a vacuum for a specified length of time and negative pressure rating. Outer containment construction which does not entail intimate contact with the primary tank must be analyzed to assure its ability to withstand a vacuum test.

10.2. A similar procedure as described in 10.1 can be followed for testing in the field.

10.3 If leaks are detected, appropriate repairs shall be made to establish tightness and the tanks shall be retested.



A. Overlap-½" (12.7) Minimum
B. Continuous Weld
C. Continuous Full Fillet Weld
D. Not Less Than Five Times Head Thickness

PEARSON EQUIPMENT & MAINTENANCE COMPANY
Complete Fueling Systems Installation & Maintenance
California State Contractors License No. 630936 - Classification: General Engineering A - C61/D40 HAZ

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DIVISION OF CLEAN WATER PROGRAMS

July 17, 2000

Mr. Charles NeSmith
State Water Resources Control Board - Division of Clean Water Programs
2014 "T" Street - P.O. Box 944212
Sacramento, California 94244-2120

Re: Regarding Proposed Amendments to the Underground Storage Tank Regulations
Public Hearing scheduled for Tuesday July 18, 2000 at 10:00 a.m.
County of Los Angeles Department of Public Works, 900 S. Fremont Ave., Alhambra, CA

Dear Mr. NeSmith,

Please include this letter into records of the meeting indicated above as my statement regarding proposed regulations to amend and add new sections, in Title 23, Division 3, Chapter 16 of the California Code of Regulations (CCR), needed to implement Health and Safety Code (HSC) sections 25284.1 and 25294.4.

My concern lies specifically with Section 2637. Secondary Containment Testing and Annual Maintenance Certification, Subsections 2637(b)(1)(B) and (C), my questions and suggestions are as follows:

Are certification training programs offered by or available from all monitoring system manufacturers?

If so, is January 1, 2002 the deadline by which the installer or maintenance technician must be certified?

What about other related tank, piping, dispensing equipment manufacturers certification program availability?

After having to enlist the services of another firm (competitor) certified by the manufacturer as required by local regulatory agency, to perform the initial startup and testing of monitoring system on site of our client's new UST installation project. Followed by an inquiry made through a local distributor, to the manufacturer of the monitoring system we often purchase and install for many of our clients, requesting information about any training programs they might offer or that we could attend in order to obtain the necessary certification and authorization for the installation, service, etc., of monitoring equipment that we were providing.
I was informed that this manufacturer (with product marketing focused more on Oil Company retail affiliates than commercial facilities), accepted personnel for certification training from only those companies which had initially been requested by the Oil Company or Jobber to service and maintain their equipment, and as a "certified" manufacturer's Authorized Service Representative, must provide 24 hour maintenance service.

Therefore, I would suggest that the amendment include requiring:

That all manufacturers of regulatory approved monitoring system equipment and related components, must offer or make available, system certification training without bias or unfair requirements as a condition of their authorization or approval, to any company properly licensed and qualified to provide these services.

Continued,

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance

California State Contractors License No. 630936 • Classification: General Engineering A - C61/D40 HAZ

We're a small company, specializing in new installation of UST and AST fuel dispensing and monitoring systems, providing preventative maintenance services, including annual functional testing of leak monitoring equipment and related components, in addition to necessary upgrades and removal of existing systems. Our clients are exclusively commercial or private businesses, we do not have the personnel or resources available that would enable us to provide our services to Oil Company or Jobber affiliated service stations.

If the amendment is adopted as written under the proposed text, it could allow manufacturers of the monitoring equipment basic control of deciding which companies, will (or will not) receive necessary certification training and authorization required to provide services for the installation, testing, maintenance, calibration, repair, or replacement of their monitoring equipment and components.

I feel our company and others like it would share an unfair disadvantage in attaining the necessary authorization and required certification. In turn forcing our clients to seek other companies for services we are fully qualified to perform and currently provide for our clients, in addition would significantly reduce current income earning potential and severely inhibit any future business growth.

Thank you for your time and I appreciate your consideration on this issue.

Sincerely,

Jack Bail

Jack Bail, President

18305 LAKE CHABOT ROAD • CASTRO VALLEY, CA 94546 • PHONE / FAX (510) 889-7888

LS17

MS. FARAHNAK: I think that's a legal interpretation that hasn't been decided. I will respond in the comments to that.

MS. NIMMO: Okay. Thank you.

MR. SILVA: Thank you. Next Wayne Geyer from the Steel Tank Institute.

MR. GEYER: Wayne Geyer, G-e-y-e-r. I guess since there is only three more commentators, and there are six hours left, I should hold my comments to under two hours. I do have a lot. I am going to give you -- I am going to go read most of it, and I do have a couple of comments I want to add on top of that, based on what I've heard this morning.

Steel Tank Institute is a non-for-profit trade association. We represent over a hundred shops that build underground and aboveground steel storage tanks. We develop stands for fabrication and installation of underground and aboveground fabricated steel storage tanks.

I want to specifically comment on the three-year testing requirements of secondary containment systems. I'm going to sound like one of these guys that goes back in time, but I do want to review some of the construction methods that have been used for secondary containments of steel storage tanks that goes back to the early '80s.

LS17-01

I would assume some of those tanks are still on the ground in California. Some standards and installation practices have evolved since that time. The ability to test the containment will require some understanding of the type of tank system in the ground, and will also require an understanding of how the tank was installed.

Ultimately, testing the secondary tank containment will entail a considerable cost to the owner/operator to test the containment. And after seeing the initial comments where you talked about 59 million dollars, I guess you already recognize that. Initially, double wall steel tanks were built to contain 110 percent containment of the primary tank. This is going back to the early '80s.

2517-01

The outer walls of such tanks, steel tanks were built similar to aboveground storage tanks. The fabricator shipped the tank with an interstitial monitoring pipe, external to the tank heads that terminated, really flush with the top of the tank. These tanks can normally be tested with three to five pounds of air pressure. However, vacuum testing would not be a recommended practice of those type of tanks without an individual structural analysis being done of that tank in its buried condition.

In 1984, the Steel Tank Institute developed the nation's first national standard for secondary containment tanks. About a year later UL introduced secondary containment into its UL 58 tank standard for steel storage tanks.

We call our standard the Dual Wall Tank Standard. The steel secondary containment shell was wrapped directly over the primary tank and typically provided a hundred percent containment. The volume of that interstice was very small with respect to the previous design that had 110 percent containment. However, the space was large enough to allow any release of stored liquid, or to allow any intrusion of ground water to travel to a monitoring pipe or port.

The monitoring pipe was normally extended to the top of the tank, usually external to the tank head by the fabricator to enable the tank to be shipped to the site. According to that standard the monitoring of the interstitial space could be accomplished by one or more of the following methods: Electronic monitoring, that was constant. Mechanical float devices. Pressure or vacuum, and even regular sticking of the interstitial.

The flexibility given to leak detection monitoring at that time was intentional. It enabled, what we hope were innovative forms of technology to be developed to detect releases. It also enable release detection systems to be developed that could monitor, not only the tanks, but could also monitor other components as well.

And I would hope that if The State does require people to go out and test every three years, that they will be open to all these different options in the

LS17-01

future. STI members use a third party insurance carrier to oversee a national warranty program on several significant types of underground steel storage tank technologies.

With over 60,000 secondary containment tanks in their database for STI labeled Double Wall Underground Steel Tanks; there have been no reported incidents of a release from any primary tank in the ground water with these STI labeled secondary containment tanks. That's a release from the primary tank in the ground water.

Most of these tanks were built either to the STI dual wall tank standard UL 58 and/or UL 1746 Part III for jacketed tanks. Again, these tanks were shipped with the interstitial monitoring port flush with the tank top, in most cases, which provide flexibility to the owners/operators installers to place various forms of release detection equipment in the interstice. As an end result, there is a wide variety of the secondary containment systems in place.

LS170

Speaking to some of our members prior to the hearing, some of them estimated that at least a quarter to a half of the existing tanks, secondary containment tanks, would require some additional work in order to perform the task that we think is required by Section 2637. For example, not all installers extended the monitoring pipe to grade.

Instead the leak detection device was mounted directly into monitoring pipe and buried flush with the tank top and several feet below grade. Keep in mind that many of these tanks were installed before or at the advent of sumps that were placed above the top of the tank. Some sumps were installed over the top of the tank to contain tank accessories. It wasn't until the early '90s that UL accepted secondary containment monitoring pipes to be installed inside the steel tank where the monitoring port can be easily made accessible within a sump.

Thus, in order to test the tank secondary containment the owner/operator may need to hire a contractor to cut through the concrete and dig to the top of each tank in order to access the interstice. For those systems in which the contractor extended the monitoring pipe to grade, such extensions were made liquid tight, but may not be pressure or vacuum testable without additional work being required.

LS17-01

This can have an impact on the tank owner's operations and will certainly generate some expense in order to meet the rule. This issue wouldn't be limited to steel tanks only, as I believe Non-metallic tanks also relied on monitoring probes for release detection of the interstice until recent times.

During the past decade, we've seen additional changes to the construction of steel secondary containment tanks. After UL published its UL 1746 Standard or corrosion control 1989, jacketed tanks became a common type of construction for the steel industry. Jacketed tanks use some sort of plastic outer containment that also acts as a corrosion control barrier. Probably the most common material for the steel tank jacket has been fiberglass or of course plastic.

Now, most jacketed tanks today are shipped with a vacuum in the interstice. The monitoring port is usually accessible within a tank sump. Usually the vacuum is released upon completion of installation and again, various forms of release detection can be installed into that interstice.

With these most recent installation, there should not be significant hardship to access the interstice, but there will still be an expense to hire a contractor to say perform a vacuum test, should these other forms of equipment not be recognized, like the electronic monitoring and float devices. Based on the performance history of STI labeled tanks, we question the need for such regular three-year testing of the outer tank containment to take place.

25170

Section 2637 (2) states that secondary containment systems must be tested either in accordance with manufacturer's guidelines or instructions or by an industry code or engineering standard. We'd like to point out at this time that the 1996 edition of the NFPA 30 Flammable and Combustible Liquids Code has language mandating a tightness testing of the interstitial space of underground secondary containment tanks prior to placing the tank in service, meaning prior to installation, or prior to being put in service.

It states that the interstitial space of such tanks shall be tested either hydrostatically or with air pressure at three to five psig or vacuum at 5.3 inches mercury, or in accordance with the listing or the manufacturer's instructions. The pressure or vacuum shall be held for one hour.

LS17-01

STI would recommend a secondary contained steel tanks built to our dual wall tank standard to UL 58 Type one secondary containment tanks, or to the UL 1746 requirements for jacketed tanks can be vacuum tested in accordance with the NFPA 30 standard. Steel tanks with 110 percent containment can be tested with air, but with no more than three psig, with the approval of the original tank manufacturer.

Section 2637(6) of the proposed regulation exempts periodic secondary containment testing, where the continuous monitoring automatically monitors both the primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum.

LS17-02

We feel that a vacuum or pressure system can have a greater sensitivity in detecting a release than hydrostatic, but we notice there is no criteria to evaluate such systems. For example, some hydrostatic system rely on visual examination of a chamber filled with liquid, installed within a sump, to determine if a release has occurred.

Similarly a pressure gauge could be mounted within a sump to provide indication that a pressure or vacuum is maintained within the interstice. Both methods rely on the owner/operator to visually inspect the equipment on a regular basis. There is no requirement of an alarm or any other device to detect leaks on a continuous basis in this section.

LS17-02

I'd like to add one other thing. By having someone go out and test the tanks every three years, my biggest fear is, if someone tries to put a large pressure into the interstice space say a jacketed tank or something of that nature, and they use an air compressor that they are going to overpressurize the system, in the end in essence may do more harm to the system, than if there wasn't any testing done at all, and if they relied on the existing electronic equipment or float gages.

LS17-01

As I said before the volume of the interstice is very small, and if someone goes out and tests the tank without knowing what the system is without knowing the limitations of the test they want to perform, they could in essence cause more damage to the tank, than if there wasn't any test at all, and cause a release.

So in conclusion we'd like to summerize our primary comments. One, existing secondary steel tanks in California have various constructions features. Two, access to the interstitial monitoring port of the tank

L18

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July 10, 2000

Mr. Charles NeSmith
Underground Storage Tank Program
State Water Resources Control Board

Re: Comments on the Proposed Amendments to the Underground Storage Tank Regulations to Implement SB 989.

Time Oil Company currently owns underground storage tanks at 19 gasoline dispensing facilities in California that will be impacted by changes to the underground storage tank regulations, resulting from implementation of SB 989. Consequently, we are grateful for the opportunity to provide you with our comments on the implementation of the proposed rules. Please do not hesitate to call me, 206/286-6449, with any questions that you may have.

Sincerely,

Paul Seidel

Paul R. Seidel
Regulatory Compliance Manager
Time Oil Company

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- Re-certification for UST system installers as proposed in (Section 2635 (d)(1)):

The concept of ensuring that installers are qualified to properly install UST systems is appropriate. However, we believe that the requirement for triennial re-certification for experienced installers is unnecessary in some cases. For installers that may perform the work infrequently, the re-training may be appropriate. However, for experienced installers the requirement could be satisfied by demonstration that the installer has been actively installing the manufacturers systems over the previous three years. In this way, the need for adequate training could be met by demonstrated proficiency while minimizing the burden of repeated training by differing manufacturers that would be time-consuming and of limited value for an experienced installer. L18-04

Additionally, we note that the requirement is for each individual manufacturer to provide training. Because there are many manufacturers of UST systems, the rule would benefit by streamlining the requirement to a single training for all or most UST systems, with individual specifics from different manufacturers highlighted. This would eliminate the need for installers to be certified by multiple manufacturers. L18-05

- Under-dispenser containment as proposed in: (Section 2636 (h)):

Since this requirement would require retrofitting existing facilities, the SWRCB should allow flexibility when approving under-dispenser containment systems. For example, there are technologies available that allow the use of liquid polymers that solidify into an effective product-tight containment. Allowing the use of alternative containment systems that avoid closing facilities and rebuilding islands is a desirable alternative. L18-02

- Testing frequency of secondary containment systems (Section 2637):

This testing requirement seems unreasonably stringent. Any leak in the primary containment would be contained by the secondary containment and detected by leak detection methods that are currently required. The probability of failures occurring in both the secondary and primary containment, while theoretically plausible, is extremely low. Given the low probability of failures existing in both primary and secondary containment, SWRCB should re-consider the proposed inspection frequency of every three years. Ideally, a requirement of this type would be based on actual or predicted data on the occurrence of failures in both containment systems. In the absence of such information, a testing frequency of approximately once every ten years seems adequate. As an additional verification that releases are not occurring into a secondary containment system, L18-01

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additional monitoring such as statistical inventory reconciliation (SIR) could be required in conjunction with a reduced secondary containment testing frequency.

- Enhanced leak-detection as proposed in (Section 2640 (e) and Section 2644.1):

SWRCB should reconsider requiring the use of tracers to meet this requirement. The rule appears to focus on potential soil contamination rather than avoiding releases. We are not aware of any reliable tracer methods for use with USTs. In our experience, this technology has resulted in many false positives (i.e., detections) and the method is relatively difficult to perform correctly. We have concerns about the reliability of the method in either clay or saturated soils. Additionally, this method is designed to detect product in soil rather than losses. We would prefer to use methods that detect releases, so that there is opportunity to correct potential leakage problems before product can be detected in soils.

LP-03

The objective of increased sensitivity to detect leaks occurring below the current regulatory threshold (i.e., 0.05 gph), can be achieved using statistical inventory reconciliation. Our SIR provider routinely achieves leak-rate sensitivities of 0.01 gph or less at a reliability of 99% probability of detection and 1% probability of false alarm exceeding the recommended standard.

Submitted by E-Mail, July 3, 2000
Chas. NeSmith

L19-01

Date: November, 1999

To: Chuck NeSmith
State Water Resources Control Board
Underground Storage tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

From: Randy Golding
Special Projects Director
Tracer Research Corporation

Subject: Written comments in response to issues and questions raised at the enhanced leak detection hearing on October 28, 1999.

In response to the Board's request for written comments we offer the following.

The board has raised several questions. It seems the chief concern is that too many leaks have been missed by existing leak detection programs and groundwater contamination has occurred in some instances. Many existing leak detection programs have vulnerabilities that could allow for undetected leaks. Some of these vulnerabilities include high leak rate thresholds and unmonitored components in the leak detection system. These unmonitored components include spillage, pumps, and vapor containment.

Enhanced leak detection should have a high probability of detecting releases before more product is released than the environment at the underground storage tank (UST) site can absorb. The minimum goal is to detect leaks before the release has an opportunity to contaminate a nearby drinking water well. The best available technology should be used. Tracer based leak detection methods offer extraordinary sensitivity without ambiguity.

Existing thresholds are too high.

Stand alone leak detection methods must be able to detect a 0.2 gallon per hour (gph) leak at least every month. A leak detection system designed to detect a 0.2 gph leak might have a threshold of 0.1 gph. The probability of detecting this leak might be as low as 50 %. At 0.1 gph, a leak can release approximately 900 gallons in a year. A release of this magnitude might contaminate a well 1000 feet away. An important limitation of internal leak detection systems is the sensitivity. Large leaks can be detected quickly, but small leaks must be ignored.

Some system components go unmonitored

Examples of portions of systems that often are not evaluated by current leak detection technologies include pump bodies and vapor containment components. While lines are often monitored, the pump itself often is not.

Systems need to be monitored for vapor releases. Pressure relief vent valves have become very common and can be designed to allow the UST to develop a slight pressure during periods when no product is being dispensed from the system. Such systems can release hundreds of gallons of vapors nightly. This is equivalent to hundreds of gallons of liquid product each year and could easily exceed acceptable levels. Since water extracts MTBE vapors from air, vapor releases are of particular concern when MTBE is present.

No matter how sensitive or reliable they can be made, many release detection methods cannot detect spills during dispensing and tank filling activities.

Of course, external product vapor monitors might, in principle, detect all of these kinds of releases, but are plagued by ambiguity problems since no one can be sure about the cause of an unexplained rise in the level of product vapors in the soil outside a UST system.

Goals

The goal of enhanced leak detection is to minimize the chance that a leak or release will go undetected long enough to lead to the contamination of a public water well. Another way to phrase this is that the intent is to prevent leakage that would lead to off site contamination. Public water wells are not likely to exist within the UST site, but might be located on an adjacent property. The wells of interest in this regulation are within 1000 feet of the UST system but are probably more than 100 feet away.

No leak detection method can achieve a threshold of zero, so the question then becomes, How small does a leak have to be so that missing it does not matter. In other words, how small of a leak should enhanced leak detection be required to detect? While it is not necessarily clear how low the new standard should be, it is apparent that the current standard of 0.1 gph to 0.2 gph (900 to 1800 gallons per year) is much too high.

Large leaks can be detected early by high frequency monitoring methods. A leak detection system capable of detecting a 0.2 gallons-per-hour (gph) leak in the first 24 hours restricts the amount of product released by such a leak to less than 5 gallons. This is a significant benefit, but it provides no protection against smaller leaks that might lead to significant contamination over time.

Small leaks must be detected, but can be detected at a lower frequency. If you could detect a 0.005 gph (40 gallons per year) you would have over 6 weeks to detect it before

5 gallons had been released. A detection threshold of 0.0005 gph would allow more than a year to pass before 5 gallons had been released.

Tracer based methods

Tracer based methods can address these concerns and achieve these goals. Acceptable sensitivities are already achievable. Sensitivities lower than 0.0005 gph or 4 gallons per year have been demonstrated by protocols more rigorous than those approved by the EPA for third party evaluations. The original third party evaluation obtained for a tracer test at UST sites was for a leak rate of 0.005 gph or 40 gallons per year. No matter what sensitivity is required, tracer methods will be able to achieve them.

Since tracer methods are external leak detection approaches, all components of the UST system including pumps, vapor containment areas and dispensers are monitored as effectively as pipes and tanks.

A consistent pattern of dispenser spills that leads to subsurface contamination will also be detected by a tracer method because the product released at the dispenser will be labeled with the tracer. If enough of the product is spilled to contaminate the soil, the leak detection tracer will also infiltrate the soil and be detected. Significant spills that occur in connection with filling events could also be detected because hydrocarbon vapors are measured at the same time samples are analyzed for the presence of the tracers.

Significant vapor leakage will also be detected with extreme sensitivity. The tracers used in tracer methods are at least as volatile as the more volatile components of gasoline. After addition to the UST system, the tracers occupy the vapor space in the containment system just as the volatile components of gasoline do. Any mechanism that would release a significant amount of gasoline vapors would release a detectable amount of the tracer as well.

Possible enhanced monitoring solutions using tracer-based methods.

The complementary advantages of tracer testing and some internal monitoring methods suggest that they could be used together to some benefit. One such approach could involve periodic testing at a sensitivity of 0.005 gph or less at sites with daily monitoring at a level of 0.2 gph. These sensitivities should be achievable using state of the art ATGs and electronic line leak detectors and tracer testing. The frequency of tracer testing could be monthly, quarterly or annual based on the sensitivity and performance of the internal leak detection system.

Alternatively, monthly monitoring at a level of 0.005 gph or less could be used in conjunction with daily monitoring at a level of 1 to 2 gph. This could be accomplished with a combination of tracer-based monthly monitoring combined with careful manual tank gauging that is reconciled on a daily basis.

An automatic tracer based leak detection system is also available for installation at UST sites. So far these systems have mainly been applied to release detection at above ground storage tank farms and large underground fuel distribution systems. These systems are as sensitive as manually performed tracer tests. The application of these systems would provide continual monitoring using an on-site, tracer-based system.

Economics of each approach

The following cost estimates are for typical service stations with three 10,000 gallon USTs. With long-term contracts, small distances between sites and flexible scheduling, these prices could be significantly reduced.

Annual, tracer-based tightness tests can be conducted for an installation and initial test cost of approximately $4300 followed by subsequent annual test costs of $1500.

After installation and initial testing, monthly monitoring can be accomplished for about $4300 per year.

Continual onsite monitoring can be conducted for about $15,000 per year. This assumes a 5-year depreciation of the monitoring equipment

Developmental-phased approach to regulations

At this early stage in the development of these regulations there are many unanswered questions.

What is the relative frequency of the different mechanisms of unauthorized release? These include leakage from the pump, vent, fill riser, spills, large/rapid-onset leaks, and small/continuous releases.

How much leakage can a site absorb? How does it vary based on soil type, ground cover, depth to water and recharge rate?

What does the site-to-well distance histogram look like?

Are contamination rates for sites with double-walled systems so much lower than for sites with single walled systems that they should be excluded?

Until some of these questions are answered, it seems sensible to use the best available technologies until reasonable standards for thresholds, monitoring frequencies, site characteristics and costs can be worked out. For annual tests, the most sensitive methods should be used until evidence can be gathered to give strong support to the appropriateness of higher thresholds.

Date: June, 2000

To: Chuck NeSmith
State Water Resources Control Board
Underground Storage tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

From: Randy Golding
Special Projects Director
Tracer Research Corporation

Subject: Proposed leak detection standards in Section 2644.1 – Enhanced Leak Detection

In November 1999 Tracer Research Corporation (Tracer) provided written comments on issues raised at the Enhanced Leak Detection hearing held on 28 October 1999. In that response, Tracer questioned whether existing standards for leak detection (0.1 and 0.2 gallons per hour) are sensitive enough to prevent the contamination of groundwater. Tracer recommended a lower sensitivity requirement for enhanced leak detection based upon the commercial availability of methods with much lower sensitivity levels.

The proposed regulations for enhanced leak detection have reduced the sensitivity requirement to 0.05 gallons per hour (gph). This is an improvement; however, a 0.05 gph leak can still release 440 gallons of product each year. It is unlikely that releases of this magnitude would be viewed as acceptable if potential releases could be reduced by using more sensitive methods.

The proposed requirements for enhanced leak detection require the use of external leak detection methods that utilize a chemical marker. The board has an opportunity to take better advantage of the sensitivity that this type of leak detection allows. The lowest sensitivity listed for this type of leak detection method in a recognized third party evaluation is 0.005 gph with a probability of detection of 0.97 and a probability of false alarm of 0.03. Over the course of a year a 0.005 gph leak would release 44 gallons. This represents a significant improvement over existing leak detection standards and seems consistent with the intent of the enhanced leak detection requirement.

Lowering the sensitivity requirement of enhanced leak detection will not exclude any methods or technologies that the proposed standard would include. A more stringent sensitivity requirement may spark innovation in a variety of competing technologies with the potential of bringing leak detection to a new level across the board.

Tracer recommends that the sensitivity requirement be lowered significantly from the proposed standard of 0.05 gph. It is possible presently to lower the requirement as low as 0.005 gph and include all of the methods that qualify under the standards as they are currently proposed.

PLEASE PRINT

NAME/TITLE Kurt Witzgall Product Manager Compliance Services

REPRESENTING Veeder-Root

ADDRESS 125 Powder Forest Dr., Simsbury CT

Wish to Speak

Yes ______ *No* ______ *If Necessary* ______

Agenda Item(s) ______

Estimated Time for Testimony ______

Other Comments on Back of this Card ☑

STATE WATER RESOURCES CONTROL BOARD

At the last public hearing Veeder-Root proposed alternative methods to the sole proposed alternative methods ~~by~~ (Tracer) source method now proposed ~~by~~ (Tracer) We have received several inquiries from our customers regarding wether the proposed alternative methods could be approved ~~as an~~ a ~~alternative~~ as enhanced leak detection. We would urge the state to re-consider giving customers the option ~~of our~~ to use any combination of the following as a substitute to the Tracer methods:

1. 3rd Party Monitoring and/or
2. More Frequent Precision Testing of Lines (0.2 biMonthly or Weekly)
3. More Frequent CSLD testing (Daily, Weekly, etc)

PLEASE PRINT

NAME/TITLE Jeff Davis - Western Regional Manager

REPRESENTING Veeder-Root Co.

ADDRESS 125 Powder Forest Dr., Simsbury CT 06070

Wish to Speak

Yes ______ No X ______ If Necessary ______

Agenda Item(s) ______

Estimated Time for Testimony ______

Other Comments on Back of this Card ☒

STATE WATER RESOURCES CONTROL BOARD

1. NOT ENOUGH options to test or monitor the secondary containment to meet enhanced monitoring/testing requirements.
2. Do NOT Sole Source to Tracer! Set a Standard/intention and let the industry propose alternatives that meet the intent or exceed it.
3.

LS21

WSPA

Western States Petroleum Association

Via e-mail and First Class Mail

July 12, 2000

Charles NeSmith
Underground Storage Tank Program
State Water Resources Control Board
Division of Clean Water Programs
2014 T Street (P.O. Box 944212)
Sacramento, CA 94244-2120

Dear Mr. ~~NeSmith~~ Chuck:

WSPA COMMENTS on PROPOSED AMENDMENTS to the UST REGULATIONS

The Western States Petroleum Association (WSPA) is a trade association representing over thirty companies that produce, refine and market petroleum products in California. Many of our member companies operate UST systems that will be impacted by the proposed changes to the underground storage tank regulations. We appreciate the opportunity to submit these comments on the proposed amendments to the UST regulations.

We are grateful to have been included in the process by which these proposed changes were developed, and while we appreciate the fact that many of our concerns have been addressed, several concerns remain. Our comments on the proposed amendments are as follows:

Section 2635, Installation and Testing Requirements for All New USTs.

Paragraph (d)(1). Tanks and piping may be made by different manufacturers, and the manufacturers may conduct refresher training more frequently than triennially. Therefore, we suggest that the language be modified to read as follows: LS21-12

> "The installer has been adequately trained as evidenced by certificates of training issued by the tank and/or piping manufacturers, as appropriate. This certification must be renewed no less frequently than every 36 months upon completion of refresher training provided by the manufacturers."

Section 2636, Design, Construction, Installation, Testing, and Monitoring Requirements for Piping and Under-Dispenser Containment.

Paragraph (h)(1)(A). According to existing policies (see UST Program Bulletin, May 17, 1995), dispensers installed after August 1, 1995 are required to have under-dispenser containment. The January 1, 2000 date contained in this section seems to be at odds with current requirements (as we understand them), and would be "retroactive" from the perspective of this rule making. LS21-04

Paragraph (h)(2). Because existing paragraph 2636(f)(3) allows for the use of other methods for monitoring underground piping, it would be appropriate to grant similar flexibility to under-dispenser containment. Accordingly, we would propose that the language be modified to read as follows: LS21-05

> "Under-dispenser containment must be designed, constructed and installed in accordance with section 26331, 2636(c)(2) and 2636(e). In addition, under-dispenser containment must either be monitored in accordance with section 2636(f) or must be capable of shutting down the dispenser in the event of a leak or unauthorized release. Separate monitoring for under-dispenser containment is not required if ...."

Paragraph (h)(3). The proposed requirement for approval, by the Division of Clean Water Programs, of dispenser spill containment or control systems apparently does not make allowance for third-party approval (e.g., Underwriters Laboratories, etc.) as is the current practice. We suggest that the language specifically reference the acceptability of third-party approvals. LS21-06

Section 2636.1, Final Division Decisions Regarding Spill Containment or Control Systems.

It seems unprecedented (perhaps unwarranted) to devote two pages of regulatory language to an appeals process for one very specific topic. WSPA suggests that, to the extent that some description of an appeals process is useful, it should be broadened to include other matters (e.g., notification that a facility is alleged to be within 1000 feet of a public drinking water well, the imposition of unreasonable requirements by a local agency, etc.)

Section 2637, Secondary Containment Testing and Annual Maintenance Certification.

We expect that the SWRCB would view the replacement of lined trench systems as being preferable to ongoing periodic testing, and, therefore, that it would be appropriate to incentivize the replacement of these systems. WSPA proposes that, where an owner/operator commits to the replacement of a lined trench system, by a date a year or so in advance of the proposed July 1, 2005 deadline, they would not be required to conduct any testing. LS21-01

Paragraph (a)(1). We suggest that, where an owner/operator of a system, which cannot be tested by conventional means, elects to go the route of enhanced leak detection testing, the requirements should state that only one test is required. There would be no benefit to conducting a potential second test on a system which is destined to be replaced by July 2005. LS21-02

Paragraph (a)(2). The language, as currently proposed, authorizes a local agency to proceed to specify a test method even though manufacturer's guidelines, industry codes or engineering standards already exist. WSPA suggests that the language be modified to read as follows: LS21-03

"Where no applicable manufacturer's guidelines, industry codes or engineering standards exist, the local agency may approve the method."

Paragraph (b)(1)(C). Manufacturers may conduct refresher training more frequently than triennially. Therefore, we suggest that the language be modified to read as follows:

"Be recertified by the manufacturer upon completion of a manufacturer's refresher course no less frequently than every 36 months."

LS21-15

Paragraph (b)(4). The proposed requirement to notify the local agency 48 hours in advance of repairs or replacements may actually delay needed repairs. Therefore we suggest that the language be modified read as follows:

"The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, calibration or certification, or scheduled repair/replacement, of monitoring equipment unless the notification requirement is waived by the local agency."

LS21-13

Paragraph (b)(5). The argument for requiring tags or stickers is based on a desire to know that the service technician has at least physically touched the equipment. While we acknowledge that one must have physical contact with a piece of hardware in order to affix a tag or sticker, the requirement really does little to ensure that the certification was proper. We submit that having to deal with tags and stickers is a cumbersome process, and only introduces additional potential compliance problems. WSPA suggests that a simpler tracking requirement be devised.

LS21-14

Section 2640, General Applicability of Article.

Paragraph (e)(1). WSPA appreciates the intent to specifically exempt piping in certain services which are deemed extremely unlikely to ever result in unauthorized releases. WSPA suggests that UST "siphon piping" also be included as a type of piping that is not considered to be single-walled. Siphon piping operates at a negative pressure much like suction piping does. Siphon piping connects two USTs across the top of the tanks; if a leak were ever to develop, the siphon would be broken and the liquid in the siphon lines would merely drain back into each of the two tanks. Thus, it would be appropriate to add siphon piping to the list of exempt piping components in this paragraph.

LS21-08

Section 2644.1, Enhanced Leak Detection.

First, we strongly believe that it is inappropriate for the State to impose any sort of requirement where that requirement can only be satisfied by a single supplier or contractor – to do so essentially grants a monopoly. Neither WSPA nor its member companies have anything whatsoever against Tracer Research Corp., the sole licensor/vendor presently capable of meeting

LS21-09

the proposed requirements as stated in paragraph 2644.1(a)(1). However, we believe that we should have choices. In fact, there is a demonstrable need for other choices because there are certain site-specific conditions where the Tracer Research technology is simply not applicable.

There are other test methods, which currently exist or which may become available, that may offer comparable assurances regarding the integrity of UST systems. Industry must be given the ability to select from among competitive service providers. One possible mechanism for broadening the universe of potential service providers would be to eliminate – or substantially modify – paragraph 2644.1(a)(1) LS21-09

Second, the SWRCB is about to embark on an extensive, state-wide, field-based research program being conducted by Tracer Research. The experience that will be gained during this testing/research program should inform the setting of future testing requirements. It would not make sense to proceed with the standards, as presently proposed, in the absence of the practical experience to be learned from the upcoming SWRCB research program. LS21-10

Third, because one of the two criteria for the applicability of enhanced leak detection requirements is the UST system having a single-walled component, and because it may be desirable to incentivize the replacement of single-walled components, WSPA suggests that a new provision be added to the requirements. The new provision should allow for a facility owner/operator to elect to replace single-walled components prior to date by which enhanced leak detection testing would otherwise be required. Replacement of single-walled components would, then, obviate the need for testing. LS21-16

Fourth, the statement of reasons supporting the proposed requirements for enhanced leak detection specifies testing on a triennial basis. WSPA believes that this is not an unreasonable requirement. However, we find no mention of the triennial frequency in the proposed regulations themselves; we believe that the requirement for triennial testing frequency should be made clear. LS21-11

Section 2666, Requirements for Upgrading Underground Piping and Dispensers.

Paragraphs (a), (b) and (c). It would seem that, since these dates are behind us, these requirements should be expressed differently.

Please do not hesitate to call me, 818/543-5324, with any questions that you may have. LS21-07

Sincerely,

Ron Wilkniss

Ronald R. Wilkniss
South Coast Issues Coordinator

2521

members of the State Board just six weeks ago. The occasion was a hearing regarding WSPA's appeal of the action taken by the Los Angeles Regional Board to pose stored water treatment or infiltration requirements at retail gasoline outlets. By contrast to the Regional Board directed promoting infiltration into the soil, these proposed amendments are much closer to what WSPA can support because they are designed to further protect the subsurface environment.

I would like to thank the staff for soliciting our input very early in this process, in particular Allan Potman, Chuck NeSmith, who worked very hard to understand our views and our concerns. Thank you, Chuck.

These final proposed amendments are now much close to what we can support. As I said a second ago. WSPA has submitted a comment letter on the proposed amendments. I do have a few extras copies this morning, if that would be helpful. My purpose in being here today is not to reiterate all the comments in the letter, but merely to underscore a few point.

First, we've suggested that provisions be added to the regulations to eliminate or at least minimize testing requirements whenever a facility elects upgrade UST components. Our suggested provisions would, for example, apply to facilities that elect to replace single wall components, trench lines, secondary containment systems, and so forth. These provisions

2521-01

would be appropriate, in our view, for the simple reasons that this would provide additional incentive to the facilities to upgrade to protect -- to expedite the system upgrade. LS21-01 + 02

Second, perhaps the greatest issue of concern to WSPA member companies is that of enhanced leak detection. Enhanced leak detection must be conducted triannually by facilities, which have any single wall components, as defined in the regulations, and are within a thousand feet of a public drinking water well. While the concept of enhanced leak detection itself is not troublesome to us, the specific requirements are significant concerns.

First of all, with respect to what we would describe as sole source, the criteria for testing are such that the requirements can only be met by a single vendor Tracer Research Corporation. While we have absolutely nothing against Tracer Research or their proprietary technology, the regulated community would really like to avoid to being wetted to a single supplier. LS21-09

We believe that there is a demonstrable need for alternative technology. We understand that there are certain sites, specific conditions that actually preclude the use of Tracer Research technology, consequently, it seems to us that there is an absolute need for other options. Yet, these options do not currently exist in the proposal.

We think that it may be premature to specify the requirements for enhanced detection at this time. The Board pursuant to the provisions of Senate Bill 989 is not to embark on statewide field base research program. Tracer Research Corporation is the contractor for this program. Thus, within the foreseeable future California State coders can expect to gain a lot of experience using Tracer Researcher's methods.

LS21-10

WSPA believes that we should give ourselves the opportunity to benefit from this experience, before specifying the requirements for future enhancement leak detection testing. And we would respectfully request that either the testing specifications be structured so that there can be met by more than one contractor, or that the requirements not be set in place at this time. Thank you, and I'll be happy to address any questions.

MR. SILVA: Thank you very much, Mr. Wilkniss. Next David Kay from Southern California Edison.

MR. KAY: Good morning. I am David Kay, Environmental Specialist with Southern California Edison. 2244 Walnut Grove Avenue, Rosemead, California. In general Southern California Edison has been supportive of the underground tank regulations over the years since the original share bill, back in the '80s. We operate several hundred motor vehicle fuel tanks throughout our service territory. In general, the rules are good and necessary and do beautifully comply.

I am not here today to talk about those tanks.

LS22

WHITE ENVIRONMENTAL ASSOCIATES
428 East Stone Canyon Way
Brea, California 92821-2648
714-529-0652 Fax 714-529-3679
weajsw@aol.com

Comments of James S. White
on
Draft CA UST Regulations (12/10/99)

Amend Section 2633(d)(1) ... The reference for this proposed regulatory change does not match the regulations currently posted on the SWRCB US T Website.

1. The requirement for a training renewal once every three years is justified as installation practices, procedures and equipment change over the years. Information from forensic investigations going to these training sessions could be an added benefit to such periodic training. See my "Other Comments."

2. There does not seem to be any provision which covers the new requirement under Section 25284.1(a)(4)(A)(i) for expanded training of UST owners, operators (I hope that this includes everyone employed at the facility) and inspectors. Is this to be the subject of future rulemaking? The sooner the better. Many LIAs have already instituted their own training requirements for UST owners/operators. LS22-01

3. As this provision falls under the section covering new installations, I would want to make sure that this training requirement covers any and all repair and upgrade activities under Article 6, "UST Repair and Upgrade Requirements." LS22-06

Add New Section 2635 ... Based on the current regulations posted on the SWRCB Website, it appears that "Installation and Testing Requirements for All New USTs" will be eliminated and replaced. LS22-01

1. The new Section should be 2635.1.

2. I support the SWRCB's observation regarding the slight benefits to be gained with a testing cycle that would be more frequent than once every 3 years.

3. I also support the exemption given to secondary containment systems with automatic "continuous" testing.

4. There should be leeway granted for the development, issuance and transfer to UST agencies an electronic version of the "monitoring system certification." LS22-02

Add Section 2644.1 ... In the SWRCB analysis regarding monitoring sensitivities, it must be recognized that at least three studies (SWRCB-Farahnak, UCDavis-Couch&Young and UST Panel-Team 2&3) have pointed to the potential significant contribution that disconnected/disabled leak detection devices have had in the large number of releases discovered during the removal of UST systems. The SWRCB may be invoking more onerous measures due to a theory without much in the way of facts. LS22-03

1. Understanding the lack of much wiggle room with regard to the statutory requirement, but there is a great level of discomfort with regard to a requirement which can be met by only one method and, perhaps, one vendor as proposed. There should be some additional consideration given to the benefits of tighter internal detection methods (e.g., more periodic ATG testing) as an alternative for enhanced leak detection. Even though increased false-alarms may occur for these UST sites in sensitive areas, further investigation should be mandated. As currently written (see #2) this would be more protective. LS22-04

2. The way this is written, the external enhanced leak detection would appear to be a snapshot in time with no apparent additional periodic monitoring/testing required after the initial test. I don't believe that that was the intent of this requirement. Then we must consider how frequent such testing should be done? No more frequent than once LS22-05

a year and no less frequent than once every 3 years. Given the significant impact of local hydro-flow conditions, perhaps the frequency should be site specific.

Amend Subsection 2633(a)(2)(A) ... The reference for this proposed regulatory change does not match the regulations currently posted on the SWRCB US T Website.

1. It would appear that this may be overkill. Either require annual inspections of cathodic protection systems or require the maintenance of a log. Perhaps the option should be given to the UST owner with a requirement for the submittal of log summaries in lieu of test results? I believe that if the log option is selected by the UST owner, testing once every 3 years should be required.

2. Electronic means of submitting of test/log information should be provided.

Add Subsections 2634(h) and (i) ... I note that there is no subparagraph (g).

Add Subsection 2640(e) and (f) ... This added requirement would cause more effort and trouble than it is worth. If existing UST systems have any non-compatible components, there is most likely no documentation and it is most likely too late to take appropriate action. Permeability information is practically nonexistent. So why put the regulated community and the agencies through such an exercise? This requirement is really more appropriate for new UST system installations.

2522-01

Other Comments ...

Forensic Investigation -- There is a requirement in SB 989, Section 25284.1(a)(1)(A), for the SWRCB to initiate a field-based research program that would, among other things, "seek to identify the source and causes of releases and any deficiencies in leak detection systems." This should become a requirement for all UST systems found to have failed. This process would serve to prevent the continued installation of potentially faulty equipment and the use of inappropriate installation procedures. The additional cost of performing a forensic investigation in conjunction with the characterization and the quantification of a release is minimal but the benefit for potential UST program improvements is great.

Any requirement for forensic investigation of failed UST systems must include provisions for the reporting of the findings to the agency, the UST owner/operator (O/O), the UST installer/maintainer, equipment manufacturers and those conducting required UST training programs.

Under-Dispenser Containment – This proposed rulemaking does not codify the various mandates in SB 989, Section 25284(a)(5)(A), (B) and (C), for the installation of under-dispenser containment Is this going to be covered under separate rulemaking?

Annual Agency Inspections -- There are no proposed amendments that would codify the section in SB 989 covering annual inspections of the UST sites by agencies or "special investigators" as mandated by SB 989, Section 25288(a), (b), (c) and (d). I presume that this would be the subject of additional rulemaking?

2522-01

WEA ustcmt1224

2522

working. If we don't test these systems, if we don't follow through on this, then we might as well not put them in the ground. Thank you.

MR. SILVA: Next speaker is Mr. James White, White Environmental Services.

MR. WHITE: For the record my name is Jim White. I'm the principal with White Environment Association, Brea, California. I have been associated with the California and federal tank programs from the start, beginning with legislation. I work very diligently on behalf of the major oil company to affect some of the regulations that we are now looking to amend.

Given that background, I have to support the overall approach that has been taken, not only by SB 989, but also by the Water Board; however, I do have some very serious concerns. One happens to be perhaps a little bit outside the scope of this hearing, but I think it merits bringing it up. As many of you know, we have 107 different agencies out there that are very antonymous.

2522-07

They don't report to anybody, but their own local governing agencies or governing bodies, and there is a whole lot of inconsistency, interpreted problems, and I understand that the Water Board has issued the LG letters to kind of bring more consistency and my hat's off to them for that.

However, over the past couple of years there

have been some studies and investigations and an audit that has shown that many of these agencies are not doing an adequate job. And this has been very well documented. And I guess I am very concerned, that although you don't have any authority over these local agencies, this is your program. And I am wondering perhaps there is something more that the Water Board can do to bring more pressure on these agencies to enforce. LS22-07

My view of these more stringent regulations is, that at least a portion of them, are as a result of inadequate enforcement. So I think we need to do more to bring more pressure on the governing bodies. And I've got to tell you, I've visited about 24, 25 various local implementing agencies here in southern California and northern California, and they are sincere.

Most of them really want to do a good job. They are finding it very difficult to get the resources to do it. And I think you heard a little bit about some of the frustrations they've had before. So just a general comment, maybe there is more of a way we can bring greater pressure to some of these local implementing agencies to more consistently enforce this program.

I did want to comment, specifically, on the enhance leak detection. As you know, I did some written comments on this. This need, perceived need for enhance leak detection, in my view, and I think you may share this view, is due to some studies that have been done, LS22-03 relative to the adequacy and effectiveness of the current leak detection equipment. And I know one of your staff members specifically worked on a study regarding this.

I just want to caution you that in both of the studies that I am thinking of, I am thinking of the Water Board study, and the one that was done by U.C. Davis, Dr. Young and Mr. Couch. Both of those studies do refer to leak detectors that have been disconnected, leak detectors -- alarms that have been disabled, so on and so forth.

As a possible problem leading up to the ineffectiveness of leak detectors. And given this, and we are not able to quantify this because we had no specific physical forensic investigation of these UST sites as you know, but given this big uncertainty, I think there is some justification to perhaps forestall the promulgation of this enhance leak detection to take a further look, number one, at the effectiveness of this sole source of technology that is available right now because there is very little information about that. And to look at the availability of other options. And with that -- Chuck?

2522-03

MR. NeSMITH: Regarding to your written comments, you're referring to the written comments you submitted --

MR. WHITE: On the original.

MR. NeSMITH: Yeah. Please resubmit it, we

B. WRITTEN COMMENTS (NOV. 22 TO DEC. 11)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #1
(Comments submitted between November 22 and December 11, 2000)

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments.

	NAME	DATE
1	BP Western Region	December 11, 2000
2	County of Los Angeles	December 11, 2000
3	County of Orange	December 11, 2000
4	*Dennis Rock*	December 11, 2000
5	Modern Welding	December 11, 2000
6	Pearson Equipment and Maintenance	December 4, 2000
7	Southern California Technical Advisory Group	December 11, 2000
8	Tosco	December 11, 2000
9	Western States Petroleum Association	December 11, 2000

①

December 11, 2000

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Charles NeSmith

Thank you for allowing BP Western Region to submit these comments on the Notice of Modifications to Proposed Underground Storage Tank Regulations Amendments for Implementation of SB 989. BP owns approximately 950 ARCO branded gasoline service stations in the state of California, of which at least half are leased to and operated by independent dealers. These comments focus on only 3 items which raise concern or confusion based on our understanding of the proposed regulations.

1. Regarding section 2637, Secondary Containment Testing, particularly (a)(2), proposed requirement that "Secondary containment systems shall be tested to test criteria no less stringent than hose used at installation." This is a new provision that was not contained in the original proposal. While we understand the intent of the provision and the need for pre-determined testing criteria, we are concerned that this provision severely limits the possibility of testing existing systems on a periodic basis, thus resulting in a defacto requirement to replace nearly all of the secondary containment systems at all RGO's throughout the state. We do not believe that such a requirement was contemplated by the legislature in SB 989, nor that such a cost was considered in the impact analysis. 1-01

As you may know from talking with other industry representatives and tank manufacturers, the industry is working to develop various alternative testing methods for existing secondary containment systems. We believe the proposed requirement should satisfy the following objectives:

- Ensure that approval of testing methods/standards is conducted by the State rather than diverging local agencies.
- The testing criteria/method/standard must ensure the integrity of the secondary system.
- Flexibility is provided for the actual development of testing methods so that industry is incentivized to find a solution(s) that ensures systems are leak-tight while allowing existing systems to remain viable.

We recommend that the agency reach out to tank equipment manufacturers for suggestions as to how the regulations can be structured to meet the objectives outlined above.

1

1. Regarding section 2640(e), "An owners or operator of an underground storage tank systems with a single-walled component that is located within 1,000 feet of a public drinking water well, as notified by the board according to its GIS mapping database, shall implement a program of enhanced leak detection …" This section also includes an appeal process for operators that believe their facility is not subject to this requirement, i.e. is not a single-walled within 1,000 feet of a well. 1-02

must do six mo. after notif. will have 2-wall in by then

We are concerned that the proposed appeals process does not envision BP's particular situation – we are in the process of upgrading all of our single-walled systems to double-walled systems to be completed mid-year of 2001. Given the proposed appeals process, we do not know how to appeal the enhanced leak detection requirement for those systems that will be re-constructed to double-walled structures following the GIS notification but prior to the enhanced leak detection deadline. We recommend that the proposed rules contemplate this and other situations that will be encountered.

2. We note that despite industry's strong and long-time objections to the sole-source mandate of Tracer Tight Testing for purposes of enhanced leak detection, the agency has now proposed an even more stringent leak detection criteria of .005, thus further locking out any potential competition to this patented technology. We are concerned that this mandated monopoly will result in unreasonable pricing on the backs of independent marketers and dealers. 1-03

Thank you for your attention. Please feel free to contact me with any questions at 213-486-2792. We would be happy to participate in an industry/government forum to derive solutions to the secondary containment testing dilemna.

Sincerely,

Tiffany Rau

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

2

RECEIVED
DEC 15 2000
Division of Clean Water Programs

IN REPLY PLEASE REFER TO FILE: EP-1

December 11, 2000

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Programs
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith:

UNDERGROUND STORAGE TANK REGULATIONS AMENDMENTS FOR IMPLEMENTATION OF SB 989

In general, this office endorses the comments agreed to at the California CUPA Forum, Southern California UST Technical Advisory Group (TAG) meeting on December 6, 2000, in Riverside, California. I understand those comments will be forwarded to you by Ann Marie Nelson of the Santa Barbara County Fire Department.

In addition to the TAG group comments, as an agency responsible for over 2500 UST sites, we are concerned with our ability to approve and inspect system upgrades within the time constraints proposed in the regulations. Based on our experience in December, 1998, we expect a considerable number of owner/operators will wait to the last minute to submit for approvals. We therefore request that the local agency be allowed a minimum of 60 days to process the approvals required by Section 2637.(a)(1). 2-01 In addition, our engineering and inspection scheduling staff works a ten-hour, four-day-week, as do a number of cities that fall within our UST jurisdiction. We therefore request that the minimum inspection notification period be increased to 72 hours, or a statement be inserted to allow a local agency to specify a longer notification period. Notification alone is not sufficient to schedule an inspection, we must agree to the proposed schedule. This appears in Section 2637.(a)(5); 2637.(b)(4); and, 2644.1.(a)(4). Note that Sections 2644.1.(a)(4) and (5) appear to be misnumbered. 2-02

Thank you for the opportunity to comment on the proposed regulations. If you have any questions on the above, please contact me at (626) 458-3539.

Very truly yours,

HARRY W. STONE
Director of Public Works

CARL W. SJOBERG
Chief, Industrial Waste Planning & Control
Environmental Programs Division

CWS:nh
CWS13\989REGS

cc: Santa Barbara County Fire Department (Ann Marie Nelson)

COUNTY OF ORANGE
HEALTH CARE AGENCY

REGULATORY HEALTH SERVICES
ENVIRONMENTAL HEALTH

JULIETTE A. POULSON, RN, MN
INTERIM DIRECTOR

MIKE SPURGEON
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3

December 11, 2000

Mr. Charles Nesmith
State Water Resources Control Board
Division of Clean Water Programs
P.O. Box 944212
Sacramento, CA 94244-2120

SUBJECT: **Comments Regarding Proposed Amendment to the Underground Storage Tank Regulations**

Dear Mr. Nesmith:

Orange County Environmental Health has reviewed the proposed amendments to the underground storage tank regulations. We would like to address the following issues:

- **Sections 2635(d) and 2636(c)** state that owners or their agents shall certify that the installation of tanks and piping shall be made on the Certificate of Compliance for Underground Storage Tank Installation Form C.

  X

  The Unified Program Consolidated forms are now used in place of "Form C". The language should be changed to the Underground Storage Tank Installation– Certificate of Compliance. 3-01

- **Section 2636(f)** is meant to define additional requirements for dispenser containment systems without audible visual sensors (i.e. mechanical floats). Dispenser containment without audible visual sensors would be required to comply with 2636(f)(1) through (4) of this section.

  Same

  It is our opinion that this section is meant to give a choice between 2636(f)(2) or (3). It should be clarified to read "Underground piping with secondary containment, including under-dispenser piping with secondary containment shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section." 3-02

- **Section 2636(f)(3)** states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2).

  Same

  The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. 3-03

- **Section 2636(g)(3)** states: "All continuous monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product at the dispenser when they detect a leak".

  Same The sentence should be corrected to read to the dispenser instead of at the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. 3-04

- **Section 2637(a)(1)** allows only 30 days for the local agency to review the proposed enhanced leak detection program.

  Same We feel that the local Agency should be allowed 60 days to respond to submittals due to the number of proposed workplans and programs that we may receive. 3-05

- **Section 2637(b)(1)** requires persons performing installation, repair, maintenance, calibration or annual certification shall meet certain licensing requirements.

  Same This section needs to clarify who is required to have the license. In most cases, one individual in the company holds the license and the technicians that perform the certifications are trained on the manufacturer's requirements. As this section is written, it appears that each individual technician shall hold a license. This is not feasible for companies that perform monitoring certifications. 306

- **Section 2637(b)(2)** states that the annual monitoring certification shall be made on the Monitoring System Certification form.

  Same Many times a monitoring system may be repaired, reprogrammed or reinstalled during the year. It is our opinion that this section should read "All monitoring equipment certification shall be made on ...", instead of only "Annual monitoring equipment certification shall be made on...". 3-07

- **Section 2640(e)(2)** regarding a request for reconsideration for enhanced leak detection requirements has been amended to remove the 30 calendar day response time by the Clean Water Programs UST Program Manager. 3-08

  Same We feel that there should be a time frame so that the local Agency knows when to require compliance.

Thank you for considering these comments. If you have any questions please call me at (714) 667-3780.

Sincerely,

Denise Fennessy

Denise Fennessy
Program Manager
Environmental Health Division

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
AMENDMENTS FOR IMPLEMENTATION OF SB 989

4

November 22, 2000

NOTICE OF MODIFICATIONS TO TEXT OF PROPOSED REGULATIONS

Pursuant to the requirements of Government Code section 11346.8(c), and section 44 of Title 1 of the California Code of Regulations, the State Water Resources Control Board (SWRCB) is providing notice of changes made to proposed regulations to implement Senate Bill 989 that were the subject of a regulatory hearing on July 18, 2000. In addition to changes made to the proposed text, amendments were also made to the original text of Chapter 16 in order to accommodate the the changes made to the SB 989 regulations. All of the changes are either in response to comments received regarding the proposed SB 989 regulations, or initiated by the SWRCB.

The text of the proposed regulations, including all changes, and the statement of reasons for the changes, are attached. Regulatory language is identified as follows:

1. The original text of Chapter 16 is in light typeface
2. The proposed regulations to implement SB 989 are in either bold strikeout or bold underline typeface
3. New changes to original text are in shaded typeface, or shaded strikeout typeface
4. Changes made to the proposed regulations to implement SB 989 are in either bold shaded underline, or bold shaded strikeout.

The SWRCB will accept written comments regarding the changes made to the proposed SB 989 regulations, and additional amendments to Chapter 16 to accommodate those changes. All written comments must be submitted to the SWRCB no later than 5:00 p.m. on December 11, 2000 and addressed to:

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA, 94244-2120
Attn: Charles NeSmith

All written comments received by December 11, 2000 that pertain to the indicated changes will be reviewed and responded to by the SWRCB staff as part of the compilation of the rulemaking file. Please limit your comments to revisions of the proposed SB 989 regulations, and changes in the original text to accommodate those revisions.

"Corrosion specialist" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on metal underground storage tanks and associated piping. The term includes only persons who have been certified by the National Association of Corrosion Engineers or registered professional engineers who have certification or licensing that requires education and experience in corrosion control of underground storage tanks and associated piping.

"Decommissioned tank" means an underground storage tank which cannot be used for one or more of the following reasons: 1) the tank has been filled with an inert solid; 2) the fill pipes have been sealed; or, 3) the piping has been removed.

<u>**"Dispenser" means an aboveground or underground device connected to underground *storage tank piping that is used for the delivery of a hazardous substance from the* underground storage tank. Dispenser includes metering and delivery devices, and fabricated assemblies located therein.**</u>

"Dispenser spill containment or control system" means a device that is capable of preventing an unauthorized release ~~from, under~~ the dispenser from entering the soil or groundwater or both.

from & from UNDER

"Emergency containment" means a containment system for accidental spills which are infrequent and unpredictable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the underground storage tank system is placed at the time of installation.

"Existing underground storage tank" means an underground storage tank that was installed prior to January 1, 1984. The term also includes an underground storage tank installed before January 1, 1987 and which is located on a farm, has a capacity greater than 1,100 gallons, and stores motor vehicle fuel used primarily for agricultural purposes and not for resale.

"Farm tank" means any one tank or a combination of manifolded tanks that: 1) are located on a farm; and 2) hold no more than 1,100 gallons of motor vehicle fuel which is used primarily for agricultural purposes and is not held for resale.

"First ground water" means the uppermost saturated horizon encountered in a bore hole.

"Free product" refers to a hazardous substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).

"Ground water" means subsurface water which will flow into a well.

"Hazardous substance" means a substance which meets the criteria of either subsection (1) or subsection (2) of section 25281(f) of the Health and Safety Code.

(1) All underground storage tanks shall be tested at the factory before being transported. The tests shall determine whether the tanks were constructed in accordance with the applicable sections of the industry code or engineering standard under which they were built.

(2) The outer surface of underground storage tanks constructed of steel shall be protected from corrosion as follows, except that primary containment systems installed in a secondary containment system and not backfilled do not need cathodic protection:

(A) Field-installed cathodic protection systems shall be designed and certified as adequate by a corrosion specialist. The cathodic protection systems shall be tested by a cathodic protection tester within six months of installation and at least every three years thereafter. The criteria that are used to determine that cathodic protection is adequate as required by this section shall be in accordance with a code of practice developed in accordance with voluntary consensus standards. Impressed-current cathodic protection systems shall also be inspected no less than every 60 calendar days to ensure that they are in proper working order.

(B) Underground storage tanks protected with fiberglass-reinforced plastic coatings, composites, or equivalent non-metallic exterior coatings or coverings, including coating/sacrificial anode systems, shall be tested at the installation site using an electric resistance holiday detector. All holidays detected shall be repaired and checked by a factory authorized repair service before installation. During and after installation, care shall be taken to prevent damage to the protective coating or cladding. Preengineered corrosion protection systems with sacrificial anodes shall be checked once every three years in accordance with the manufacturer's instructions.

(3) Before installation, the tank shall be tested for tightness at the installation site in accordance with the manufacturer's written guidelines. If there are no guidelines, the primary and secondary containment shall be tested for tightness with air pressure at not less than 3 pounds per square-inch (20.68 k Pa) and not more than 5 pounds per square-inch (34.48 k Pa). In lieu of the above, an equivalent ~~differential~~ NEGATIVE pressure test, expressed in inches of mercury vacuum, in the interstitial space of the secondary containment, is acceptable. EQUIVALENT TO 1 STD. ATMOSPH min. & 2 STD ATMOSPHERE max The pressure (or vacuum in the interstitial space) shall be maintained for a minimum of 30 minutes to determine if the tank is tight. If a tank fails the tightness test, as evidenced by soap bubbles, or water droplets OR A loss of VACUUM installation shall be suspended until the tank is replaced or repaired by a factory authorized repair service.. Following repair or replacement, the tank shall pass a tightness test.

(4) All secondary containment systems shall pass a post-installation test which meets the approval of the local agency.

(7) For primary containment systems installed completely beneath the ground surface, the original excavation for the secondary containment system shall have a water-tight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as water-tight as practical. Primary containment systems with integral secondary containment and open vaults are exempt from the requirements of this subsection.

(8) The actual location and orientation of the tanks and appurtenant piping systems shall be indicated on as-built drawings of the facility. Copies of all drawings, photographs, and plans shall be submitted to the local agency for approval.

(d) Owners or their agents shall certify that the installation of the tanks and piping meets the conditions in subdivisions (1) through (5) below. The certification shall be made on a "Certificate of Compliance for Underground Storage Tank Installation Form C" (see Appendix V).

(1) The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers. **On and after July 1, 2001, t~~T~~his certification shall be renewed ~~every 36 months upon~~ by completion of refresher training provided by the manufacturer. Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is ~~shorter.~~** LONGER

(2) The installer ~~has been certified or~~ IS licensed by the Contractors State License Board~~.~~, & The LICENSE IS ISSUED IN The INSTALLING CONTRACTORS NAME & IS of the PROPER TYPE FOR WORK ON A UST SYSTEM

(3) The underground storage tank, any primary piping, and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions;

(4) All work listed in the manufacturer's installation checklist has been completed; and

(5) The installation has been inspected and approved by the local agency, or, if required by the local agency, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, **25284.1, 25291** and 25299, Health and Safety Code; 40 CFR 280.40 - 280.45.

2636. Design, Construction, Installation, Testing, and Monitoring Requirements for Piping ~~and Under-dispenser Containment.~~

(a) Except as provided below, piping connected to tanks which were installed after July 1, 1987, shall have secondary containment that complies with the requirements of section 2631 for new underground storage tanks. This requirement does not apply to piping described as follows:

(1) vent or tank riser piping, provided the primary containment system is equipped with an overfill prevention system meeting the requirements specified in sections 2635(b)(2)(B) or (C); or,

(2) vapor recovery piping if designed so that it cannot contain liquid-phase product; or,

(3) suction piping if the piping is designed, constructed, and installed as follows:

(A) The below-grade piping operates at less than atmospheric pressure (suction piping);

(B) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released (gravity-flow piping);

(C) No valves or pumps are installed below grade in the suction line. Only one check valve is located directly below and as close as practical to the suction pump;

(D) An inspection method is provided which readily demonstrates compliance with subdivisions (A) through (C) above.

(b) All corrodible underground piping, if in direct contact with backfill material, shall be protected against corrosion. Piping constructed of fiberglass-reinforced plastic, steel with cathodic protection, or steel isolated from direct contact with backfill, fulfills this corrosion protection requirement. Cathodic protection shall meet the requirements of section 2635(a)(2).

(c) Underground primary piping shall meet all of the following requirements:

(1) Primary piping in contact with hazardous substances under normal operating conditions shall be installed inside a secondary containment system which may be a secondary pipe, vault, or a lined trench. All secondary containment systems shall be sloped so that all releases will fl[illegible]llection sump located at the low point of the underground piping.

SUBJECT TO ENHANCED LEAK DETECTION?

false alarm no greater than 5 percent. ~~Compliance with these standards shall be certified in accordance with section 2643(f) of Article 4.~~ 4 MEETS THE REQUIREMENTS of 2643(c)(1).

(3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the methods otherwise required by this section. ~~A~~ Ccontinuous monitoring systems as described in subdivision (1), which shuts down the pump in addition to either activating the audible and visual alarm system or stopping the flow of product at the dispenser, satisfy~~ies~~ the automatic line leak detector requirement of subdivision (2).

(4) Monitoring shall be conducted on all underground pressurized piping with secondary containment at least annually at a pressure designated by the equipment manufacturer, provided that the method is capable of detecting a minimum release equivalent to 0.1 gallon per hour defined at 150 percent of the normal operating pressure, OR 40PSI which ethier IS LESSER of the product piping system at the test pressure with at least a 95 percent probability of detection and not more than a 5 percent probability of false alarm. This requirement is waived if the criteria in subsection (g) of this section are met.

(g) Underground pressurized piping which meets all of the following requirements satisfies the annual tightness test requirement specified in subsection (f)(4):

(1) All ~~The~~ secondary containment systems ~~is~~ are equipped with ~~a~~ continuous monitoring systems. The leak detection device may be located at the pump sump for sections of ~~if~~ the piping that slopes back to this point.

(2) All ~~A~~ continuous monitoring systems ~~is~~ for the piping are connected to ~~an audible and visual alarm system and~~ the pumping system.

(3) All ~~A~~ continuous monitoring systems for the piping shuts down the pump and either activates an audible and visual ~~the~~ alarm ~~system~~ or stop the flow of product at the dispenser when they detect a leak ~~a release is detected~~.

(4) The pumping system shuts down automatically if any of the continuous monitoring systems for the piping fail or are ~~is~~ disconnected.

(5) The requirements of subdivisions (3) and (4) do not apply to an emergency generator, provided the monitoring system is checked at least daily.

<u>(h) Under-dispenser containment shall be designed, constructed, and installed in accordance with the following:</u>

<u>(1) Owners or Operators of a UST system shall have the system fitted with under-dispenser containment, or an approved dispenser spill containment or control system according to the following schedule:</u>

(A) **<u>At the time of installation for systems installed after January 1, 2000.</u>**

~~with a system that can be tested in accordance with this section on or before July 1, 2005.~~

(2) Secondary containment systems shall ~~must~~ be tested to test criteria no less stringent than those used at installation. Additionally, secondary containment systems shall be tested in accordance with manufacturer's guidelines ~~and~~ or standards. If there are no manufacturer's guidelines or standards, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard. If there are no manufacturers guidelines, industry codes, or *engineering* standards a test method approved by a state registered professional engineer shall be used. ~~In lieu of testing in accordance with manufacturers guidelines, industry code, or an engineering standard, the local agency may approve the method.~~

MOST TANK TESTERS NOT QUALIFIED

(3) Secondary containment testing shall be performed by ~~either a licensed tank tester, licensed tank installer, or~~ any person meeting the requirements of subsection 2637 (b)(1).

(4) Underground storage tank owners and operators shall submit a copy of the test report to the local agency within 30 days of the completion of the test.

(5) Owners and operators of underground storage tanks must notify the local agency at least 48 hours prior to conducting the test, *unless this notification* requirement is waived by the local agency.

(6) Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or under constant vacuum, are exempt from periodic secondary containment testing.

(b) All monitoring equipment used to satisfy the requirements of this article shall be installed, calibrated, operated and maintained in accordance with manufacturer's instructions, and certified every 12 months for operability, proper operating condition, and proper calibration. Written records *shall be maintained* as required in section 2712. On or after January 1, 2002 the following shall also apply: ~~annual certification of monitoring equipment shall be conducted as follows:~~

(1) Persons ~~A person~~ performing installation, repair, maintenance, calibration or annual certification of monitoring equipment ~~the annual monitoring equipment certification~~ *shall meet the following requirements:*

SECONDARY CONTAINMENT TESTING

(A) Possess a current Class "A" General Engineering Contractor License, ~~C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License,~~ or C-61 (D40) Limited Specialty

T REALLY QUALIFIED

Service Station Equipment and Maintenance Contractor License issued by the Contractors State License Board. & meets requirements of 2635(d)(1) and;

(B) Be trained and certified by the manufacturer of the monitoring equipment; and,

(C) Be re-certified by the manufacturer ~~upon~~ by completion of a manufacturer's refresher course. ~~every 36 months.~~ Additionally, this certification shall be renewed at the time interval recommended by the manufacturer, or every 36 months, whichever is shorter.

(2) Annual ~~The~~ monitoring equipment certification shall be made on a "Monitoring System Certification" form (see Appendix VI).

(3) UST owners and operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days after completion of the inspection.

(4) The UST owner or operator shall notify the local agency at least 48 hours prior to conducting the installation, repair, replacement, calibration, or certification of monitoring equipment unless the notification requirement is waived by the local agency

(5) A person conducting UST monitoring equipment certification shall affix a tag/sticker on each monitoring equipment component that is being certified, repaired, or replaced. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was certified, repaired, or replaced, and the contractors license number.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25281, 25284.1, 25291 and 25292, Health and Safety Code; 40 CFR 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, sections 2640 and 2641 of the California Code of Regulations to read as follows:

2640. General Applicability of Article

(a) The requirements of this article apply to owners or operators of existing underground storage tanks.

(b) The requirements of this article apply during the following periods:

(1) Any operating period, including any period during which the tank is empty as a result of withdrawal of all stored substances before input of additional hazardous substances;

~~operability or running condition. Written records shall be maintained as required in section 2712 of Article 10.~~

(k) When an unauthorized release is indicated during the installation of a release detection system, the owner or operator shall comply with the release reporting requirements of Article 5 and, if the release came from the existing tank, shall cease the installation process until the tank system is replaced, repaired, upgraded, or closed in accordance with the applicable provisions of this chapter.

(l) When implementation of the monitoring program, or any condition, indicates that an unauthorized release may have occurred, the owner or operator shall comply with the release reporting requirements of Article 5 and shall replace, repair, or close the underground storage tank in accordance with the applicable provisions of this chapter.

Authority cited: Sections 25299.3 and 25299.7, Health and Safety Code.
Reference: Sections 25283, 25284.1, 25291 and 25292 Health and Safety Code; 40 CFR 280.40 and 280.41.

Amend Title 23, Division 3, Chapter 16, Article 4, to add new section 2644.1 of the California Code of Regulations as follows:

2644.1 Enhanced Leak Detection

(a) An owner or operator who is required, pursuant to section 2640(e), to implement a program of enhanced leak detection or monitoring shall comply with the requirements of this section as follows:

(1) Enhanced leak detection means a test method that ascertains the integrity of an underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system.

(2) The enhanced leak detection test method shall be third party certified, in accordance with section 2643(f), for the capability of detecting ~~both~~ vapor AND/OR ~~and~~ liquid phase releases from the underground storage tank system. The enhanced leak detection test method shall be capable of detecting a leak rate of at least ~~0.05~~ 0.005 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the local agency within 6 months following notification by the board The enhanced leak detection shall be implemented no later than ~~12~~ 18 months following receipt of notification from the board and repeated every 36 months thereafter.

<u>(3) Owners and operators of underground storage tanks subject to the requirements of this section must notify the local agency at least 48 hours prior to conducting the enhanced leak detection test unless this notification requirement is waived by the local agency.</u>

(4) **<u>Owners and operators of underground storage tanks subject to the requirements of this section shall submit a copy of the enhanced leak detection test report to the ~~board and the~~ local agency within 60 days of completion of the test.</u>**

<u>Authority cited: Sections 25299.3, and 25299.7, Health and Safety Code.</u>
<u>Reference: Sections 25283, 25291, 25292 and 25292.4, Health and Safety Code; 40 CFR 280.40 and 280.41.</u>

Amend Title 23, Division 3, Chapter 16, Article 6, section 2660 and 2666 of the California Code of Regulations to read as follows:

2660. General Applicability of Article

(a) This article describes the requirements for repairing or upgrading underground storage tank systems. Upgrades and repairs shall be properly conducted in accordance with this article and any additional manufacturers' specifications.

(b) Section 2661 describes the requirements for repairing underground storage tanks, piping, or other underground storage tank system components that have caused an unauthorized release as defined in sections 25294 and 25295 of the Health and Safety Code.

(c) Section 2662(b) describes upgrade requirements for underground storage tanks containing hazardous substances other than motor vehicle fuel. Sections 2662(c), and (d) describe upgrade requirements for all underground storage tanks containing motor vehicle fuel. Underground storage tanks which contain motor vehicle fuel and which are constructed of fiberglass, other non-corrosive materials, steel clad with fiberglass, or steel clad with other noncorrosive materials, are not required to comply with the requirements of section 2662(c), but are required to meet the requirements of section 2662(d).

(d) Section 2663 describes the requirements for upgrading or repairing tanks using interior lining.

(e) Section 2664 describes the requirements for upgrading tanks using bladder systems.

(f) Section 2665 describes the upgrade requirements for spill and overfill prevention equipment.

(g) Section 2666 describes the upgrade requirements for underground piping **<u>and dispensers.</u>**

(h) Upgrade requirements for underground storage tanks, spill and overfill prevention, and underground piping shall be completed no later than December 22, 1998**<u>. Upgrade requirements for dispensers shall be completed no later than December 31, 2003</u>**.

MONITORING SYSTEM CERTIFICATION-~~DRAFT~~

For Use By All Jurisdictions Within the State of California
Authority Cited:- Chapter 6.7, Health and Safety Code; Chapter 16, Division 3, Title 23, California Code of Regulations

This form must be used to document testing and servicing of monitoring equipment. ~~If more than one monitoring system control panel is installed at the facility, a~~ A separate certification or report must be prepared for each monitoring system control panel by the technician who performs the work. A copy of this form must be provided to the tank system owner/operator. The owner/operator must submit a copy of this form to the local agency regulating UST systems within 30 days of test date. ~~Instructions are printed on the back of this page.~~

A. General Information

Facility Name: ______________________ Bldg. No.: ________

Site Address: ______________________ City: ____________ Zip: ________

Facility Contact Person: ______________________ Contact Phone No.: (____) ________

Make/Model of Monitoring System: ______________________ Date of Testing/Servicing: ___/___/___

B. Inventory of Equipment Tested/Certified

Check the appropriate boxes to indicate specific equipment inspected/serviced~~.~~:

Tank ID: ______________________
- ☐ In-Tank Gauging Probe. Model: ________
- ☐ Annular Space or Vault Sensor. Model: ________
- ☐ Piping Sump / Trench Sensor(s). Model: ________
- ☐ Fill Sump Sensor(s). Model: ________
- ☐ Mechanical Line Leak Detector. Model: ________
- ☐ Electronic Line Leak Detector. Model: ________
- ☐ Tank Overfill / High-Level Sensor. Model: ________
- ☐ Dispenser Containment Sensor(s). Model: ________
- ☐ Shear Valve(s).
- ☐ Dispenser Containment Float(s) and Chain(s).
- ☐ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________
- ☐ In-Tank Gauging Probe. Model: ________
- ☐ Annular Space or Vault Sensor. Model: ________
- ☐ Piping Sump / Trench Sensor(s). Model: ________
- ☐ Fill Sump Sensor(s). Model: ________
- ☐ Mechanical Line Leak Detector. Model: ________
- ☐ Electronic Line Leak Detector. Model: ________
- ☐ Tank Overfill / High-Level Sensor. Model: ________
- ☐ Dispenser Containment Sensor(s). Model: ________
- ☐ Shear Valve(s).
- ☐ Dispenser Containment Float(s) and Chain(s).
- ☐ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________
- ☐ In-Tank Gauging Probe. Model: ________
- ☐ Annular Space or Vault Sensor. Model: ________
- ☐ Piping Sump / Trench Sensor(s). Model: ________
- ☐ Fill Sump Sensor(s). Model: ________
- ☐ Mechanical Line Leak Detector. Model: ________
- ☐ Electronic Line Leak Detector. Model: ________
- ☐ Tank Overfill / High-Level Sensor. Model: ________
- ☐ Dispenser Containment Sensor(s). Model: ________
- ☐ Shear Valve(s).
- ☐ Dispenser Containment Float(s) and Chain(s).
- ☐ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________
- ☐ In-Tank Gauging Probe. Model: ________
- ☐ Annular Space or Vault Sensor. Model: ________
- ☐ Piping Sump / Trench Sensor(s). Model: ________
- ☐ Fill Sump Sensor(s). Model: ________
- ☐ Mechanical Line Leak Detector. Model: ________
- ☐ Electronic Line Leak Detector. Model: ________
- ☐ Tank Overfill / High-Level Sensor. Model: ________
- ☐ Dispenser Containment Sensor(s). Model: ________
- ☐ Shear Valve(s).
- ☐ Dispenser Containment Float(s) and Chain(s).
- ☐ Other (specify equipment type and model in Section E on Page 2).

C. Certification

- I certify that the equipment identified in this document was inspected/serviced in accordance with the manufacturers' guidelines. Attached to this Certification is information (e.g. manufacturers' checklists) necessary to verify that this information is correct and a ~~Site~~ Plot Plan showing the layout of monitoring equipment. For any equipment capable of generating such reports, I have also attached a copy of the report; *(check all that apply)*:

- ☐ **System set-up**
- ☐ **Alarm history report.**
- ☐ LINE LEAK REPORT

Technician Name (print): ______________ ~~Cert./Lic. No.:~~ ________ Signature: ______________

Certification No.: ______________ License. No.: ______ LIC CLASS

Testing Company Name: ______________________ Phone No.: (____) ________

5

From: Richard Reisz <rreisz@MODWELDCO.COM>
To: "'holtryd@cwp.swrcb.ca.gov'" <holtryd@cwp.swrcb.ca.gov>
Date: 12/11/00 9:16AM
Subject: FW: Amendments for Implication of SB989 dated November 22, 2000

-----Original Message-----
From: Richard Reisz
Sent: Monday, December 11, 2000 9:01 AM
To: 'welchj@gwgate.swrcb.ca.gov'
Cc: 'pattona@swrcb.ca.gov'
Subject: Amendments for Implication of SB989 dated November 22, 2000

Gentlemen:

This is the first comment we have made regarding the proposed regulations enacted by Senator Sher's bill SB989.

The comment is in regards to subsection 2644.1(a)(2). The new proposed leak rate we received today states 0.005 gallon per hour. I have talked to third party certification people this morning and they do not think 0.01 is attainable as there has been talk in another state of this goal. They do know that they have methods and procedures to certify 0.05 equipment. I believe that the 0.005 leak detection rate should be put on the back burner until such time as industry has time to verify that such equipment exists by more than one manufacture. 5-01

Sincerely,

Richard Reisz
Assistant Manager
Modern Welding Company of California, Inc.
4141 N. Brawley Ave.
Fresno, CA 93722
Phone 559.275.9353
Personal Fax 559.271.7630
General Fax 559.275.4381
Email RReisz@modweldco.com <mailto:RReisz@modweldco.com>

(6)

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance
California State Contractors License No. 630936 -- Classification: General Engineering A - C61/D40 HAZ

November 27, 2000

RECEIVED
DEC 4 2000
Division of Clean Water Programs

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs - Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Re: UST Regulations Title 23, Division 3, Chapter 16, CCR amendments for implementation of SB 989.

Dear Mr. NeSmith,

I received the your letter dated November 22, 2000, providing notice of text modifications and changes made to the proposed regulations referenced above, in response to statements heard during and written comments received after the regulatory hearing held in Los Angeles on July 18, 2000.

I had also submitted a letter dated July 17, 2000 to your office for review (copy enclosed), stating my written concerns and suggestions. However, upon reading the changes to the proposed text and amendments to the original text of Chapter 16, I was disappointed to find no response nor references pertaining to my question and suggestion regarding specific requirements for all manufacturers of regulatory approved monitoring systems and components, including other related piping and dispensing equipment to offer or make available, necessary system training, certification and re-certification programs, without bias or unfair requirements as a condition of their authorization or approval to any and all properly licensed companies or individuals qualified in providing these services.

I strongly feel the requirement would benefit all parties associated or affected by these regulations in providing positive support to securing qualified personnel to meet requirements specified under **Section 2635. Installation and Testing Requirements for All New Underground Storage Tanks, subsections 2635.(d)(1) and Section 2637. Secondary Containment Testing and Annual Maintenance Certification, subsections 2637.(b)(1)(A),(B) and (C).**

Therefore, I respectfully ask the Board to address this question and suggestion, requesting the Board's response include the reasons to reconsider or dismiss any possible revisions or amendments to the proposed regulations that would accommodate this requirement to be included.

Thank you for your time and I appreciate your consideration on this issue.

Sincerely,

Jack Bail

Jack Bail, President

(6)

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance

California State Contractors License No. 630936 • Classification: General Engineering A - C61/D40 HAZ

July 17, 2000

Mr. Charles NeSmith
State Water Resources Control Board - Division of Clean Water Programs
2014 "T" Street - P.O. Box 944212
Sacramento, California 94244-2120

Re: Regarding Proposed Amendments to the Underground Storage Tank Regulations
Public Hearing scheduled for Tuesday July 18, 2000 at 10:00 a.m.
County of Los Angeles Department of Public Works, 900 S. Fremont Ave., Alhambra, CA

Dear Mr. NeSmith,

Please include this letter into records of the meeting indicated above as my statement regarding proposed regulations to amend and add new sections, in Title 23, Division 3, Chapter 16 of the California Code of Regulations (CCR), needed to implement Health and Safety Code (HSC) sections 25284.1 and 25294.4.

My concern lies specifically with Section 2637. Secondary Containment Testing and Annual Maintenance Certification, Subsections 2637(b)(1)(B) and (C), my questions and suggestions are as follows:

Are certification training programs offered by or available from all monitoring system manufacturers?

If so, is January 1, 2002 the deadline by which the installer or maintenance technician must be certified? 6-01

What about other related tank, piping, dispensing equipment manufacturers certification program availability?

After having to enlist the services of another firm (competitor) certified by the manufacturer as required by local regulatory agency, to perform the initial startup and testing of monitoring system on site of our client's new UST installation project. Followed by an inquiry made through a local distributor, to the manufacturer of the monitoring system we often purchase and install for many of our clients, requesting information about any training programs they might offer or that we could attend in order to obtain the necessary certification and authorization for the installation, service, etc., of monitoring equipment that we were providing.
I was informed that this manufacturer (with product marketing focused more on Oil Company retail affiliates than commercial facilities), accepted personnel for certification training from only those companies which had initially been requested by the Oil Company or Jobber to service and maintain their equipment, **and** as a "certified" manufacturer's Authorized Service Representative, must provide 24 hour maintenance service.

Therefore, I would suggest that the amendment include requiring:

> That all manufacturers of regulatory approved monitoring system equipment and related components, **must** offer or make available, system certification training without bias or unfair requirements as a condition of their authorization or approval, to any company properly licensed and qualified to provide these services.

Continued,

(6)

PEARSON EQUIPMENT & MAINTENANCE COMPANY

Complete Fueling Systems Installation & Maintenance

California State Contractors License No. 630936 - Classification: General Engineering A - C61/D40 HAZ

We're a small company, specializing in new installation of UST and AST fuel dispensing and monitoring systems, providing preventative maintenance services, including annual functional testing of leak monitoring equipment and related components, in addition to necessary upgrades and removal of existing systems. Our clients are exclusively commercial or private businesses, we do not have the personnel or resources available that would enable us to provide our services to Oil Company or Jobber affiliated service stations.

If the amendment is adopted as written under the proposed text, it could allow manufacturers of the monitoring equipment basic control of deciding which companies, will (or will not) receive necessary certification training and authorization required to provide services for the installation, testing, maintenance, calibration, repair, or replacement of their monitoring equipment and components.

6-01

I feel our company and others like it would share an unfair disadvantage in attaining the necessary authorization and required certification. In turn forcing our clients to seek other companies for services we are fully qualified to perform and currently provide for our clients, in addition would significantly reduce current income earning potential and severely inhibit any future business growth.

Thank you for your time and I appreciate your consideration on this issue.

Sincerely,

Jack Bail

Jack Bail, President

18305 LAKE CHABOT ROAD - CASTRO VALLEY, CA 94546 - PHONE / FAX (510) 889-7888

Submitted by Cal CUPA Forum by e-mail on 12-11-00.

(7) Chas. McSmith

Southern California Region
Underground Storage Tank Technical Advisory Group

Comments on "Modifications of Proposed Text of Regulations" dated 11/22/00

Comments on specific sections of proposed regulations:

Section 2636(f)

Add …."**<u>in compliance with either 1,2 and 4 or 1,3 and 4 of the following:</u>**"

To read …

Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems **<u>in compliance with either 1,2 and 4 or 1,3 and 4 of the following:</u>** 7-01

Section 2636(g)(3)

Change "at" to "to"

To read ……

All continuos monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **<u>to</u>** the dispenser when they detect a leak. 7-02

Section 2637(a)(1)

Change the local agency review time to **60** days

To read …..

The local agency shall review the proposed program of enhanced leak detection within **<u>60</u>** days of submittal or re-submittal. 7-03

Section 2637(a)(2)

Add to the 1st sentence and the last sentence "and approved by the local agency"

To read…

Secondary containment systems shall be tested to test criteria no less stringent than those used at installation **<u>and approved by the local agency. ……..</u>**If there are no manufacturer's guidelines, industry codes, or engineering standards a test method approved by a state registered professional engineer **<u>and approved by the local agency.</u>** 7-04

Additionally… does "state registered professional engineer" mean California or any state?? 7-05

Section 2637(b)(1)

The term "Person" in this section is a problem due to definition of the term. The individual that we want to ensure has the <u>training</u> is the hands-on technician not the owner of the company for whom the technician works.

Suggestion:

Separate sections (B) and (C) from (A) into a sub section that addresses training of the hands-on folks. 7-06

7

Section 2637(b)(2)

Change Annual to All and make certification plural.

To read

All monitoring equipment certifications shall be made on a "Monitoring System Certification" form (see Appendix VI)

7-07

Section 2640(e)(2)

Include a timeline for response by the Program Manager. We suggest 90 days and send a copy of the decision to the local agency to ensure knowledge of the responsibility of the owner/operator and for enforcement purposes.

7-08

To read

Owners or operators notified by the board who believe that their facility is not subject to this requirement may request reconsideration by the Division of Clean Water Programs Underground Storage Tank Program Manager. The request shall be in writing and received by the Underground Storage Tank Program Manager within 60 calendar days of the date the notification was mailed. **The Program Manager shall make a decision on the request within 90 calendar days of receipt of the request. The Program Manager shall also forward a copy of the decision to the local agency.**

TOSCO

Tosco Marketing Company
P.O. Box 25376
Santa Ana, California 92799
Telephone: 714-428-7600
Facsimile: 714-428-8053

Via Fax, Email and First Class Mail

December 11, 2000

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

TOSCO COMMENTS ON PROPOSED AMENDMENTS TO UST REGULATIONS

Thank you for the opportunity to comment on these proposed amendments to the UST regulations. TOSCO Marketing Company has a few specific comments on the proposed amendments; these are shown on the attached sheets.

Please do not hesitate to call me, 714/428-7606, with any questions that you may have.

Sincerely,

Michael A Bryan

Michael Bryan
Regional Environmental Compliance Manager
South Coast Region

COMMENTS TO THE PROPOSED AMMENDMENTS TO SB 989 DATED 11/22/2000

1. 2630(d) Further clarification is required. The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies. For instance; regulators may develop an interpretation that requires electronic line pressure (ELP) sensors on double walled piping, because ELP could provide an earlier detection of a product piping leak than the currently required turbine sump probes. P-01

2. 2636 (h)(1)(B) Text refinement required. We believe the text should read: "By July 1, 2001, for systems installed after July 1, 1987 that are located within 1000 ft of a public drinking water well, as **correctly** identified and **confirmed** pursuant to the state Geographic Information System mapping database." The text should also reference section 2640(e)(2)&(3) which allows for correction of either distance to a public drinking water well or the existence of single walled components, within 60 calendar days of the initial notification. P-02

3. 2637(2) For most pieces of equipment, the manufacturer will have test criteria for post installation testing. Whether the criteria is "no less stringent then those used at installation" has not been determined by the equipment manufacturer. For tanks, the installation testing criteria might be an air test with soapy foam above ground. This type of test would not be practical once the tank is buried. If a piece of equipment has a testing criteria established by its equipment manufacturer, this testing criteria is the standard. To test beyond the manufacturer's criteria may void the manufacturers warranty. P-03

4. 2644.1(a)(2) We are opposed to reducing the leak detection standard to .005 gph, one-tenth of what the current regulations require. We understand that a high degree of false positives may be encountered with this lower detection limit. Even a 5% false alarm rate will be very costly when considering the fact that UST systems may be mistakenly excavated to address "apparent" UST system leaks. P-04

   In addition, the State should confirm that any proposed monitoring standard is achievable by more than one company. We are concerned that these low standards will create a monopoly for the Tracer Tight Technology. P-05

5. Appendix VI - I don't see when the UST Monitoring Plot Plan would be used since all sites must have monitoring and hazardous material management plans (HMMPs) Existing monitoring and HMMP requirements should satisfy this portion of the proposed regulation. P-06

WSPA
Western States Petroleum Association

(9)

RECEIVED
DEC 15 2000
Division of Clean Water Programs

Via e-mail and First Class Mail

December 11, 2000

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

WSPA COMMENTS ON PROPOSED AMENDMENTS TO UST REGULATIONS

The Western States Petroleum Association (WSPA) is a trade association representing over thirty companies that produce, refine and market petroleum products in California. Many of our member companies operate UST systems that will be impacted by the proposed regulatory changes.

Thank you for the opportunity to comment on these proposed amendments to the UST regulations. We also appreciate having been included in the reg-review process which led to the amendments which are now being proposed. The reg-review task force was very worthwhile.

WSPA has a few specific comments on the proposed amendments; these are shown on the attached sheets.

Please do not hesitate to call me, 818/543-5324, with any questions that you may have.

Sincerely,

Ronald R. Wilkniss
South Coast Issues Coordinator

505 No. Brand Blvd., Suite 1400 • Glendale, California 91203 • (818) 545-4105 • FAX: (818) 545-0954

COMMENTS on PROPOSED AMENDMENTS to UST REGULATIONS

Amendments to Title 23, Division 3, Chapter 16, Article 1, Section 2611.

It may be helpful, to reword the term "Dispenser spill containment or control system" in order to enhance the distinction between it and "Under-dispenser containment". As one possibility, changing to "Under-dispenser spill control system" would place the two definitions next to each other in the list, thus, making a distinction readily apparent. Further, the definition might be expanded to include the words "... a device, which is not Under-dispenser containment, that is capable ...". (Note: Wording at section 2636(h) would also have to be reworked for consistency.) 9-01

Amendments to Title 23, Division 3, Chapter 16, Article 3, Section 2630, and 2636.

2630(a). It might be helpful, for the sake of improved clarity, to either include a specific effective date, or, to reference the definitions of new UST and/or existing USTs (i.e., "... owners of new underground storage tanks (as defined in Section 2611)". 9-02

2636(f). It would seem to be necessary to specify that the requirements for monitoring also apply to dispensers equipped with the alternative spill containment/control system. 9-03

2636(g)(4). There appear to be practical problems with the requirement that the "pumping system shuts down automatically if ***any*** of the continuous monitoring systems for the piping fail or are disconnected". For example:

- Lack of clarity. Because it has not been defined, "pumping system" could be interpreted to mean the turbine pump in the UST, an affected fuel dispenser, all fuel dispensers for a particular product, or even the entire site. Further, the language specifies that pumping is to be shut down in the event that any monitoring system fails. We believe that remedial action should focus on the problem location, and respectfully suggest that the language be changed to make this clearer. Lastly, it should be noted that in the rare event of a UST leak, it is beneficial to continue – not cease – the dispensing of gasoline because it contributes to a lowering of the product level in the tank. 9-04
- Equipment capabilities. Although the goal of this requirement is noteworthy, we are not aware of any currently-available system which can detect the failure of a component or tampering. If this goal is to be met, adequate time must be allowed for system development and for conversion/upgrading of existing systems. We believe that this issue should be a topic for further discussion rather than being required at this time. 9-05

Amendments to Title 23, Division 3, Chapter 16, Article 3, New Section 2637.

2637(a). Because the amendments will not be approved by OAL until after January 1, 2001, it would seem appropriate to change the effective date, from January 1, 2001, to "... six months after the date of adoption ...". 9-06

2637(a)(1). This section requires that existing containment systems, which cannot be tested per regulatory requirements, must be replaced. There will be cases where it should be feasible to "repair, modify, or upgrade" some types of existing systems so that they can be appropriately tested. We request that such an allowance be added. 9-07

2637(a)(2). The requirement that systems be "tested to test criteria no less stringent than those used at installation" is somewhat vague. In addition, there might be cases where there is a conflict with a manufacturer's post-installation testing guidelines because there may be certain options which cease to exist once the installation is complete and the facility is put into service. For example, whereas highly-sensitive vacuum testing might be used to verify the integrity of under-dispenser containment after initial installation, this type of testing cannot necessarily be performed once risers and conduits are extended up into the dispenser. We suggest that, 1) the language of the requirement be clarified, and 2) a clause be added to enable facilities to avoid any potential conflict between installation and post-installation testing, respectively. 9-08

Amendments to Title 23, Division 3, Chapter 16, Article 3, New Section 2644.1.

2644.1(a)(1). There is, to the best of our knowledge, only one technology which fully meets the criteria as set forth in this section. While neither WSPA, nor its member companies, have any objections to sole known provider of the technology, we submit that it is not appropriate for the state to essentially grant a monopoly. We are simply concerned about the prospects of being "married" to a sole-source supplier. Accordingly, we respectfully request that the criteria be amended to allow for a set of alternate criteria which can be demonstrated to be equally effective. 9-09

WSPA also believes that it is premature to mandate one unique approach to enhanced leak detection at this time. The SWRCB is currently embarking on its field-based research program using Tracer Research Corporation as the testing sub-contractor. As the study program progresses, all of the parties to the program can expect to gain significant experience with the use of Tracer Research's technology and its application to RGOs. While we are optimistic that the testing program will be successful, it is certainly conceivable that problems will be encountered. Because all of the experience from the field-based research program should be factored into a decision regarding the criteria for enhanced leak detection, we suggest that, at minimum, a technology-review step be included in the Board's adopting resolution for the amendments. 9-10

2644.1(a)(2). While we understand the basis for the change in leak rate detection capability to a level of 0.005 gph, the change results in facilities being "wedded" to a sole-source supplier to an even greater degree. Thus, for this reason, we oppose the change. 9-11

Amendments to Title 23, Division 3, Chapter 16, Article 3, New Section 2660.

2660(h). These regulations do not require the "upgrading" of the actual dispensers, per se. Thus, in order to avoid any confusion, it would be appropriate to change the second sentence to read as follows: "Requirements for under-dispenser containment, or under-dispenser spill control systems, shall be completed no later than December 31, 2003." 9-12

C. WRITTEN COMMENTS (DEC. 22 TO JAN. 8)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #2
(Comments submitted between December 22, 2000 and January 8, 2001)

Commenters are listed and numbered in alphabetical order (see table below), along with the date they submitted comments.

	NAME	DATE
1	BP Western Region	January 8, 2001
2	Chevron	January 8, 2001
3	City of San Rafael	January 8, 2001
4	County of Orange	January 4, 2001
5	Dennis Rock	January 8, 2001
6	Tosco	January 8, 2001
7	Veeder Root	January 8, 2001
8	Western States Petroleum Association	January 8, 2001

A1

From: "Tiffany E. Rau" <TRAU@mail.arco.com>
To: <nesmithc@gwgate.swrcb.ca.gov>
Date: 1/8/01 3:23PM
Subject: BP Comments

Via Electronic Mail

January 8, 2001

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

BP COMMENTS ON PROPOSED AMENDMENTS (DECEMBER 22, 2000) TO UST REGULATIONS

Thank you for this current opportunity to comment on these latest proposed amendments to the UST regulations. BP owns approximately 980 ARCO-branded retail gasoline stations in the state of California that will be impacted by this rulemaking.

This communication focuses on our concerns regarding the implementation of the proposed addition of Section 2637(a) to Title 23, Division 3, Chapter 16, Article 3, paragraph 2, requiring that all existing secondary containment systems are tested by January 1, 2002. Due to our large number of sites, we must begin this testing immediately at a rate of 4 sites per business day in order to comply with the deadline.

We are concerned that while testing needs to begin immediately, the regulations have not yet been formally adopted. Therefore, we must ask a few questions relating to the practical implementation of the testing requirement, such as (1) Will a test that is performed prior to the formal adoption of the regulations actually qualify as a compliant test? (2) Are local agencies ready to receive testing notifications? (3) Is there any barrier to us proceeding with testing right now? A1-01

In light of the above concerns with the timing of the requirement, we respectfully ask for you consideration in extending the deadline for testing of secondary containment systems for at least one additional year. As an alternative, we recommend that you also consider a requirement for multi-site operators to test a third of their stations beginning this year, to be completed by the end of 2003. Under this scenario, a three year clock would begin upon each sites testing completion. This alternating triennial testing schedule would avoid the inevitable rush leading to a universal deadline. A1-02

We appreciate the opportunity to comment and your consideration of our suggestions. Please feel free to contact me with any questions at 213-486-2792.

Tiffany Rau
BP Regulatory Affairs

A-2

Chevron

Chevron Products Company
6001 Bollinger Canyon Road, Bldg. L
P.O. Box 6004
San Ramon, CA 94583

K. F. Wiseman
Senior Compliance Specialist
Phone No. 925 842-5864
Fax No. 925 842-9591

January 8, 2001

VIA FAX, E-MAIL, AND FIRST CLASS MAIL

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

RE: COMMENTS ON PROPOSED AMENDMENTS TO UST REGULATIONS

Dear Mr. NeSmith:

Chevron appreciates the opportunity to comment on the proposed amendments to the UST regulations. We have no real comments on the most recent proposed changes (December 22, 2000 draft). However, in further review of the entire proposed amendments we have several areas of concern, which are detailed below:

- 2637 (a): *"Secondary containment systems installed on or after January 1, 2001 shall be tested upon installation, 6 months after installation, and every 36 months thereafter"*. Since the amended regulations will not be approved by OAL until at least March or April 2001, it is unclear as to the enforceability of this January 1, 2001 date. A2-01
    - It would seem appropriate to change the effective date to *"... six months after the date of adoption"*.

- 2637 (a): *"Secondary containment systems installed prior to January 1, 2001 shall be tested by January 1, 2002 and every 36 months thereafter"*. Our interpretation of the proposed regulations is that the majority of Chevron sites would be required to be tested because they are secondarily contained and do not appear to meet the testing exemption criteria. Therefore we believe that it will be impossible for the entire industry to meet this deadline because there are not enough certified testing contractors available to conduct the testing by this date. In addition, we believe that this short deadline for testing existing secondary containment actually penalizes those companies who have been proactive in protecting the environment by voluntarily installing dispenser containment. The January 1, 2002, date for testing existing secondary containment (including under dispenser containment) is unfair when the proposed regulations allow up to December 31, 2003 to install under dispenser containment. This effectively places a higher burden and more costs on those companies who have already installed dispenser containment by requiring them to test the equipment before other A2-02

VIA FAX, E-MAIL, AND FIRST CLASS MAIL

companies are required to even install dispenser containment. Therefore, the following language is suggested:

- *"Secondary containment systems installed prior to January 1, 2001 shall be tested by December 31, 2003 and every 36 months thereafter"*.

- The proposed deadlines associated with 2637(a)(1) would also need to be re-evaluated and appropriately adjusted to be consistent with any revision to the deadline date for testing secondary containment systems (2637a). A2-03

- Lastly, it is unclear as to what the consequences are for failing a secondary containment test and what actions need to be taken. We want to make sure that any requirements take into consideration that there is no confirmed release of product since the primary containment is tight. A2-04

I would be happy to discuss these issues in further detail, if necessary. Please give me a call at 925/842-5864 if you have any questions.

Sincerely,

Kim F. Wiseman

Kim F. Wiseman

CITY OF San Rafael

Mayor
Albert J. Boro

Council Members
Paul M. Cohen
Barbara Heller
Cyr N. Miller
Gary O. Phillips

Fire Chief
Robert E. Marcucci

RECEIVED
JAN 09 2001
Division of Clean Water Programs

January 4,2001

State Water Resources Control Board
Division on Clean Water Programs
Underground Storage Tank Programs
P.O. Box 944212-2120
Sacramento, CA 94244-2120
Attn: Charles NeSmith

Re: Written Comments regarding changes to proposed SB 989 regulations.

Dear Mr. NeSmith:

I am submitting to you my suggested comments for Section 2636 (f) (1) & (3) and (g)(1) of the December 22,2000 "Modifications of Proposed Text of Regulations". Thank you for your consideration of these proposals.

Proposal:

2636 (1) All the secondary containment, including under-dispenser containment and under-dispenser spill control or containment systems, shall be equipped with a continuous monitoring system that ~~either~~ activates an audible and visual alarm ~~or~~ and stops the flow of product ~~at~~ from the dispenser when it detects a leak.

Reasoning: We are finding in the field that alarms are consistently being ignored and or reset (silenced). Stopping the flow altogether is the most effective intent of this regulation. Allowing the system to just sound an alarm is inviting and providing operators/workers an easy way to circumvent the law.

A3-01

2636 (3) Other monitoring methods may be used in lieu of the requirement in subdivision (2) if it is demonstrated to the satisfaction of the local agency that the alternate method is as effective as the method otherwise required by this section. Continuous monitoring systems as described in subdivision (1), which ~~shut down~~ stops the flow of product to the dispenser ~~pump~~ in

Fire Department Offices: 1039 C Street, San Rafael, CA 94901
Administration: (415) 485-3304 Fire Prevention: (415) 485-3308
Fax: (415) 453-1627

addition to ~~either~~ activating the audible and visual alarm ~~or stopping the flow of product at the dispenser~~ satisfy the automatic line leak detector requirement of subdivision (2).
Reasoning: Again, alarms are being ignored. If we are going to allow a relaxation of a GPH leak detection requirement (subsection 2) we must have the most capable detection and correction abilities in place. Removing "or stopping the flow of product at the dispenser" because it says the same thing as the previous sentence which states the system should "stop the flow of product……" A3-01

2636 (g) (1) All secondary containment systems are equipped with continuous monitoring systems that will stop the flow of product from the dispenser and sound an audible and visual alarm at a continuously monitored location. The leak detection device may be located at the pump sump for sections of the piping that slope back to this point; or;
If pressure piping is run in series between dispensers, and grading problems prohibit some sections of piping between dispensers to drain to the pump sump for monitoring, the under-dispenser pans of the effected dispensers may be equipped with a sensor that will stop the flow of product from all dispensers and sound an audible and visual alarm at a continuously monitored location. A3-02
Reasoning: The minimum reaction of the continuous monitoring system should be stated. The reaction is consistent with the recommendation of both a product stoppage and an audible alarm as seen above.
We find in the field especially with a series run of piping that sometimes between the dispensers slope to the pump sump becomes difficult.

If you have further questions I may be reached at 415-485-3309.

Sincerely,

Bradley R. Mark
Hazardous Materials Coordinator

COUNTY OF ORANGE
HEALTH CARE AGENCY

REGULATORY HEALTH SERVICES
ENVIRONMENTAL HEALTH

JULIETTE A. POULSON, RN, MN
INTERIM DIRECTOR

MIKE SPURGEON
DEPUTY AGENCY DIRECTOR
REGULATORY HEALTH SERVICES

STEVEN K. WONG
INTERIM DIRECTOR
ENVIRONMENTAL HEALTH

MAILING ADDRESS:
2009 EAST EDINGER AVENUE
SANTA ANA, CA 92705-4720

TELEPHONE: (714) 667-3600
FAX: (714) 972-0749
E-MAIL: environhealth@hca.co.orange.ca.us

FAX TO THE FOLLOWING NUMBER: (916) 341-5808

THE FOLLOWING PAGES ARE FOR:

Name of Individual: Charles NeSmith

Telephone Number: (email) nesmith@cwp.swrcb.ca.gov

Firm Name: State Water Resources Control Board

Documents Transmitted: Comments Regarding Modifications to Text of Proposed Regulations

Comments:

From: Eileen M. Kirtley for Denise Fennessy — (714) 667- 3768
HCA/Environmental Health — **Telephone No.**

TOTAL NUMBER OF PAGES:

This Information Sheet plus 2 **Page(s)**

Date Sent: 01/08/01 **Time Sent:** 11 **a.m. / p.m.** (circle one)

If you do not receive all the pages, please call (714) 667-3771 as soon as possible to request a retransmission.

FAX Operator:

Rev: 12/1/99

COUNTY OF ORANGE
HEALTH CARE AGENCY

REGULATORY HEALTH SERVICES
ENVIRONMENTAL HEALTH

JULIETTE A. POULSON, RN, MN
INTERIM DIRECTOR

MIKE SPURGEON
DEPUTY AGENCY DIRECTOR
REGULATORY HEALTH SERVICES

STEVEN WONG, REHS, MPH
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SANTA ANA, CA 92705-4720

TELEPHONE: (714) 667-3600
FAX: (714) 972-0749
E-MAIL: environhealth@hca.co.orange.ca.us

January 4, 2001

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
P.O. Box 944212
Sacramento, CA 94244-2120

SUBJECT: **Comments Regarding Modifications to Text of Proposed Regulations**

Dear Mr. Nesmith:

Orange County Environmental Health has reviewed the additional changes made to the proposed underground storage tank regulations. We would like to address and reiterate the following issues:

- **Section 2611** provides a new definition for "Dispenser". The last sentence states: "Dispenser includes metering and delivery devices, and fabricated assemblies located therein". A4-01

  The definition needs to be clarified as to whether a day tank, connected to a backup generator, would be considered a dispenser under this definition. If it does not fit the definition, this should be addressed.

- **Section 2636(f)** is meant to define additional requirements for dispenser containment systems without audible visual sensors (i.e. mechanical floats). Dispenser containment without audible visual sensors would be required to comply with 2636(f)(1) through (4) of this section.

  It is our opinion that this section is meant to give a choice between 2636(f)(2) **or** (3). It should be clarified to read "Underground piping with secondary containment, including under-dispenser piping with secondary containment, shall be equipped and monitored with monitoring systems and must be in compliance with subsections (1), (2) and (4) or subsections (1), (3) and (4) of this section." A4-02

- **Section 2636(f)(3)** states continuous monitoring systems as described in subdivision (1), which shut down the pump in addition to either activating the audible and visual alarm or stopping the flow of product **at** the dispenser satisfy the automatic line leak detector requirement of subdivision (2).

  The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. A4-03

- **Section 2636(g)(3)** states: "All continuous monitoring systems for the piping shut down the pump and either activate an audible and visual alarm or stop the flow of product **at** the dispenser when they detect a leak".

  The sentence should be corrected to read **to** the dispenser instead of **at** the dispenser. Stopping the flow of product at the dispenser does not prevent product from leaking from the pipe since product is still being pumped to the dispenser. If the flow of product is shut off at the pump, then there is no product being pumped through the pipeline. A4-04

- **Section 2637(b)(2)** states that the annual monitoring certification shall be made on the Monitoring System Certification form.

  Many times a monitoring system may be repaired, reprogrammed or reinstalled during the year. It is our opinion that this section should read "**All** monitoring equipment certification shall be made on ...", instead of only "Annual monitoring equipment certification shall be made on...". A4-05

Thank you for considering these comments. If you have any questions please call me at (714) 667-3780.

Sincerely,

ise Fennessy
Program Manager
Environmental Health Division

DENNIS D. ROCK CONSTRUCTION

A5

State Water Resources Control Board
Division of Clean Waters Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120
Atten: Mr. Charles NeSmith

January 8, 2001

Dear Chuck,

I am herein responding to your last Notice of Modification to the Amendments for Implementation of SB 989.

2637(a) 3, still includes tank testers as being eligible to test secondary containment. If they are a licensed tank tester and they do not possess a contractors license of the types listed in 2637 (b) (1) they are not qualified to test secondary containment or perform any other work on a tank system. There is also the question of maintaining the proper insurance to protect the client and the environment. All they are licensed to do is test the primary tank integrity.

By definition of H & SC 6.7 as amended 01-01-97, Section 25281(y) "Underground tank System" includes connected piping and containment systems. By definition of the Business and Professions Code and the CSLB regulations, to provide work on a tank system other than tank testing you must have the proper contractors license. To a large extent, the major problems for the underground tank program have occurred because unqualified persons have been allowed to work on tank systems and remediation projects. A5-01

The testing of secondary containment is going to involve the disassembly and reassembly of various piping components and electronic monitoring system components within the tank system, both at the dispenser island and at the tank. Tank testers are not trained to accomplish this type of work nor are they trained to provide the type of testing that will be required. In conversations with tank manufacturers it is also apparent that they are not happy with this inclusion. It is my belief that tank testers be removed from 2637 (a) 3 as qualified persons.

On a side bar note, how is it that the owner of the tank has to fulfill financial responsibility requirements in favor of the people of California yet under SB 989 the guy who might blow up the tank during a test, while there is product in the tank, doesn't have to provide anything to anybody? A vacuum test is still the best way to go regardless of what all the local agency experts say. A5-02

Sincerely,

Dennis D. Rock

Dennis D. Rock

A6

Via Fax, and First Class Mail

January 8, 2001

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA. 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

TOSCO COMMENTS ON PROPOSED AMENDMENTS TO (SB 989) UST REGULATIONS

Attached is a letter and comments that Tosco submitted December 11, 2000 to respond to the State Water Resources Control Board's request for comments dated November 22, 2000. We are also in receipt of the December 22, 2000, Notice of Modifications to Text of Proposed Regulations.

Upon reviewing the December 22, 2000 document, we find that none of Tosco's comments to the November 22, 2000 document were addressed. We are not sure if the Board intends to combine comments from the November 22 and December 22, 2000 documents and respond at one time or if Tosco's previous comments were missed.

We are re-submitting the letter sent December 11. We are particularly concerned about the Board's revision to section 2644.1(a)(2) which addresses enhanced leak detection. We believe reducing the leak detection rate to 0.005 gph could result in many false positives. With detection limits as proposed, it is possible that very small surface spills from automobile overfills could appear to be leaking UST systems. Since no other tests are available to confirm the reliability of the enhanced leak detection test, operators could be faced with unnecessary excavation of "tight" UST systems only to find that nothing was wrong with the system.

Thank you for the opportunity to comment on these proposed amendments to the UST regulations. Please do not hesitate to call me, 714/428-7606, with any questions that you may have.

Sincerely,

Michael A. Bryan

Michael Bryan
Regional Environmental Compliance Manager
South Coast Region

COMMENTS TO THE PROPOSED AMMENDMENTS TO SB 989 DATED 11/22/2000

1. 2630(d) Further clarification is required. The current language, "earliest possible opportunity" lends itself to possible misinterpretations by different regulatory agencies. For instance; regulators may develop an interpretation that requires electronic line pressure (ELP) sensors on double walled piping, because ELP could provide an earlier detection of a product piping leak than the currently required turbine sump probes. A6-06

2. 2636 (h)(1)(B) Text refinement required. We believe the text should read: "By July 1, 2001, for systems installed after July 1, 1987 that are located within 1000 ft of a public drinking water well, as **correctly** identified and **confirmed** pursuant to the state Geographic Information System mapping database." The text should also reference section 2640(e)(2)&(3) which allows for correction of either distance to a public drinking water well or the existence of single walled components, within 60 calendar days of the initial notification. A6-02

3. 2637(2) For most pieces of equipment, the manufacturer will have test criteria for post installation testing. Whether the criteria is "no less stringent then those used at installation" has not been determined by the equipment manufacturer. For tanks, the installation testing criteria might be an air test with soapy foam above ground. This type of test would not be practical once the tank is buried. If a piece of equipment has a testing criteria established by its equipment manufacturer, this testing criteria is the standard. To test beyond the manufacturer's criteria may void the manufacturers warranty. A6-01

4. 2644.1(a)(2) We are opposed to reducing the leak detection standard to .005 gph, one-tenth of what the current regulations require. We understand that a high degree of false positives may be encountered with this lower detection limit. Even a 5% false alarm rate will be very costly when considering the fact that UST systems may be mistakenly excavated to address "apparent" UST system leaks. A6-03

   In addition, the State should confirm that any proposed monitoring standard is achievable by more than one company. We are concerned that these low standards will create a monopoly for the Tracer Tight Technology. A6-04

5. Appendix VI - I don't see when the UST Monitoring Plot Plan would be used since all sites must have monitoring and hazardous material management plans (HMMPs) Existing monitoring and HMMP requirements should satisfy this portion of the proposed regulation. A6-05

125 Powder Forest Drive
Post Office Box 2003
TEL: (860-651-2700

FAX Cover Page

Engineering, Sales, and Marketing Department

FAX No. (860) 651-2719

For:	Mr. Charles Nesmith
Firm:	SWRCB
FAX No:	916-341-5808

From:	Alan Betts
Date:	1/8/01
Time:	6:00 pm EST

Total Number of Page(s) 4 (Including Cover Sheet)

Message:

VEEDER-ROOT
125 Powder Forest Drive
Post Office Box 2003
Simsbury, CT 06070-7684

TEL: (860) 651-2700
FAX: (860) 651-2719

A7

January 8, 2001

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA. 94244-2120

Dear Mr. NeSmith,

Thank you for the invitation to comment on the proposed Senate Bill 989 regulations, and the additional amendments to Chapter 16 accommodating those changes. As you know Veeder-Root has extensive experience in manufacturing automatic tank gauging systems that provide for inventory control, in-tank leak detection, liquid sensor monitoring, and electronic line leak detection.

Our published recommendations as a manufacturer are intended to facilitate the inspection of our equipment in a safe and effective manner. We have concerns regarding the requirements to perform in-field functional testing according to the "Monitoring System Certification" draft presented in the amendments to Chapter 16 of SB 989.

Based on the design of systems and the actual experience of managing sites, we believe that regular evaluation of tank and line leak test results, combined with proactive follow-up on sites that do not achieve regular results, are highly effective means of confirming release detection performance and minimizing the time between releases and their detection. A7-01

On-site inspections that include an evaluation of regular monthly documentation help enforce regular evaluation of results, and are detecting many problems such as non-functioning or disabled equipment and failure to maintain leak detection records. These problems would have been detected by a program of regular review of tank and line test results, and follow-up on tanks that do not achieve results.

Of course Veeder-Root will develop the necessary hardware, instructions, and training materials to support of any regulations enacted that require field functional testing.

We feel that the following issues exist when requiring field evaluations or functional testing of in-tank gauging and liquid sensing equipment:

Test Procedure: Veeder-Root sees no value in the removal and functional testing of in-tank probes that have consistently provided accurate inventory and leak detection results.

Coordination: Many electronic systems are remotely monitored by the customer or a designated third party. The removal of the in-tank probe or liquid sensors will produce an alarm, which will initiate a response by the monitoring center. Co-ordination with the partie(s) providing remote monitoring will be required. Documentation of the alarm closures will need to reflect the inspection process.

Safety: Removal of in-tank probes and/or sensors is often complicated in that the probes are unwieldy and easily damaged. As an example sensors installed into the narrow interstice of a double wall tank are often installed before the tank is filled, as the tank can deform and compress the interstitial space when completely full. If an inspection of a double wall tank sensor on a fiberglass tank occurs when the tank is completely full, it may difficult but possible to remove the sensor for inspection by pulling on the installation cord. But it may be quite impossible to push the sensor back into proper position after the inspection, at least until the tank is partially emptied.

A7-01

System Operation: The removal of in-tank probes and sensors will cause alarms that must be reset. Since these alarms resulted from the testing procedure itself the alarm history should be cleared to avoid confusion. This modification of the systems memory will also clear actual alarms that occurred. Technicians will need specific post-test procedures for each model tested.

We feel that the following issues exist when requiring field evaluations or functional testing of electronic line leak detection equipment:

Test Procedure: The operation of electronic systems varies by manufacturer and model. A test procedure for each model will be required.

Coordination: Many electronic systems are remotely monitored by the customer or a designated third party. The quantitative test by definition produces an alarm, which will initiate a response by the monitoring center. Co-ordination with the partie(s) providing remote monitoring will be required. Documentation of the alarms related to inspection processes will need to be documented.

Safety: Quantitative testing requires unrestricted product flow through an orifice into a container, during which the submersible pump must remain on. Electronic systems control submersible pump operation, and routinely turn the pump on at various intervals to perform leak detection functions. These intervals may change depending on the site configuration such as type and length of piping. Clear procedures are required to ensure that the pump, which must be on to enable the test, cannot run while the test apparatus is being installed or when the container is not safely in place.

System Operation: Upon detecting the induced leak, the electronic system will disable the submersible pump. Different models have varied procedures for confirming a no-leak condition, and returning the pump to proper operation. Technicians will need specific post-test procedures for each model tested.

The checklist refers to inducing precision (0.1 and 0.2 gph) line leak tests to verify proper operation of the electronic line leak device. In-field functional testing at precision thresholds is impractical. Precision level tests can run several hours causing significant down time for the retail marketer. We specifically recommend that the section G, first checklist item, be modified to eliminate the need for precision testing on an annual equipment certification basis. 47-01

Once again, Veeder-Root will work closely and cooperate with the SWRCB as regulations are put into effect. Additionally we will support formulation of test procedures as called for by California regulations.

Sincerely,

Alan Betts

Alan Betts
Product Marketing Manager
(860) 651-2782 abetts@veeder.com

cc: Shala Farahnak - SWRCB
Dean Cheramie - Veeder-Root

WSPA

Western States Petroleum Association

RECEIVED
JAN 10 2001
Division of Clean Water Programs

Via Facsimile and First Class Mail

January 8, 2001

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

WSPA COMMENTS ON PROPOSED AMENDMENTS (DECEMBER 22, 2000) TO UST REGULATIONS

The Western States Petroleum Association (WSPA) is a trade association representing over thirty companies that produce, refine and market petroleum products in California. Many of our member companies operate UST systems that will be impacted by the proposed regulatory changes. Thank you for this current opportunity to comment on these latest proposed amendments to the UST regulations.

We are comfortable with the changes proposed in the December 22 package. Further, we note with appreciation, that some of the changes are consistent with some of our previous comments and recommendations. Where our previous comments did not result in our recommended changes to the proposed amendments, we look forward to reviewing the staff responses to those comments.

The proposed addition of Section 2637(a) to Title 23, Division 3, Chapter 16, Article 3, was the subject of a previous WSPA comment. However [redacted] earlier comment may not have been sufficiently clear or complete. [redacted] respectfully request that consideration be given to the following expanded comment (the original comment, from our letter of December 11, 2000, is in italics): A8-01

2637(a). *Because the amendments will not be approved by OAL until after January 1, 2001, it would seem appropriate to change the effective date, from January 1, 2001, to "... six months after the date of adoption ...".* This comment reflects our concern with retroactive applicability to systems which will have been installed prior to the legally effective date of the amendments.

However, we are also concerned with the second part of the paragraph which requires that all "grandfathered" systems be tested no later than January 1, 2002. Our concern stems from the A8-02

505 No. Brand Blvd., Suite 1400 • Glendale, California 91203 • (818) 545-4105 • FAX: (818) 545-0954

fact that, since these requirements will not be legally binding until after OAL review, there will be less time – perhaps significantly less time – for owner/operators to test their systems and still meet the January 2002 deadline. Even the one year period initially contemplated may be insufficient for owners having a large number of sites; we believe that there are simply not enough testing contractors. Accordingly, we request that, consideration be given to allowing owners of a large number of sites to test approximately one-third of them each year, with completion of the first full three-year cycle required by December 31, 2003 (a date which is consistent with the requirement for installation of secondary containment in Section 2666(e)). AP-02

There are other timing issues which, because of unforeseen length of the regulatory process, are becoming an increasing concern for WSPA-member companies:

- July 1, 2001 is the deadline for installing under-dispenser containment, at sites installed after July 1987, if the site is within 1000 feet of a public drinking water well (2636(h)(1)(B)). It is WSPA's understanding that the Board's notification process is not complete. Therefore, it does not seem realistic to expect a site to take action, which is supposed to be based on notification from the State Board, and to complete that action by the rapidly approaching date of July 1, 2001. Accordingly, we suggest that a period of one year be allowed – commencing with the date of notification by the Board. AP-04
- The proposed deadlines associated with other requirements (such as those in Section 2637(a)(1), for replacing secondary containment systems which cannot be tested, submitting an alternate workplan and conducting enhanced leak detection) should also be re-evaluated from the perspective of reasonableness and consistency with the balance of the requirements. AP-03

We would be pleased to discuss any of these issues with you. Please do not hesitate to call me, 818/543-5324, with any questions that you may have.

Sincerely,

Ron Wilkniss

Ronald R. Wilkniss
South Coast Issues Coordinator

D. WRITTEN COMMENTS (JAN. 9 TO JAN. 26)

STATE WATER RESOURCES CONTROL BOARD
UNDERGROUND STORAGE TANK REGULATIONS
TITLE 23, DIVISION 3, CHAPTER 16, CCR
AMENDMENTS FOR IMPLEMENTATION OF SB 989

SWRCB RESPONSE TO COMMENTS
15-DAY COMMENTS #3
(Comments submitted between January 9 and January 26, 2001)

	NAME
1	Chevron
2	Fiberglass Tank Institute
3	Western States Petroleum Association

[Click here and type address]

facsimile transmittal

To:	Mr. Charles NeSmith	Fax:	916 /341-5808
From:	Kim Wiseman / Chevron	Date:	01/26/01
Re:	UST Regulation Comments	Pages:	3 (including cover page)
CC:	[Click here and type name]		

☐ Urgent X For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Attached are Chevron's comments for the January 9, 2001 draft of the UST regulations.

Kim

Chevron

Chevron Products Company
6001 Bollinger Canyon Road, Bldg. L
P.O. Box 6004
San Ramon, CA 94583

K. F. Wiseman
Senior Compliance Specialist
Phone No. 925 842-5864
Fax No. 925 842-9591

January 26, 2001

VIA FAX AND E-MAIL

Mr. Charles NeSmith
State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

RE: COMMENTS ON PROPOSED AMENDMENTS TO UST REGULATIONS

Dear Mr. NeSmith:

Chevron appreciates the opportunity to comment on the most recent (January 9, 2001) proposed amendments to the UST regulations. As indicated in my January 8, 2001 letter to you, Chevron is very concerned about the deadline for completing all secondary containment testing. We appreciate that you moved the deadline from January 1, 2002 to January 1, 2003. Although, this new deadline gives tank owners an additional year to accomplish the testing, we still believe that this deadline should at a minimum be extended to December 31, 2003, for the following reasons:

- Almost every UST facility will be conducting some type of secondary containment testing ranging from only dispenser pans to complete site testing, including double wall tanks, double wall piping, dispenser pans and turbine sumps. Most of this equipment has not been tested since initial installation, and some new testing protocols will be in use. It is reasonable to believe that the first round of testing may not go smoothly. B1-01
- UST owners/operators will be utilizing the same limited testing contractor and agency resources during testing.
- Increasing the time frame to conduct the initial testing will increase the efficient use of existing resources and will make the 36 month follow up testing cycle easier to manage. B1-02
- The January 1, 2003 deadline requires testing of existing dispenser pans before all facilities are even required to install dispenser pans (December 31, 2003). It would seem more equitable and reasonable for these dates to be the same. B1-03
- The proposed deadlines associated with 2637(a)(1) were not changed when the testing deadline was extended to January 1, 2003. At a minimum, these deadlines should be adjusted and pushed back a year to work with the current testing deadline of January 1, 2003. B1-04

VIA FAX AND E-MAIL

Mr. Charles NeSmith
January 26, 2001
Page 2

We continue to be concerned that these regulations include ongoing testing of secondary containment related to most double wall tanks and piping. Double wall tanks and piping with electronic monitoring are considered "state of the art" for underground storage systems by industry and most regulatory agencies. N-05

I would be happy to discuss these issues in further detail, if necessary. Please give me a call at 925/842-5864 if you have any questions.

Sincerely,

Kim F. Wiseman

Kim F. Wiseman

Fiberglass Tank & Pipe Institute

Sullivan D. Curran, P.E., Executive Director Internet: www.fiberglasstankandpipe.com
11150 S. Wilcrest Dr., Suite 101 • Houston, Texas 77099-4343 • Telephone (281) 568-4100 • Facsimile (281) 568-4500

Facsimile 3 Pages ~ 916-341-5808 & Priority Mail

January 25, 2001

B2

Mr. Chuck NeSmith
State Water Resources Control Board
Cal/EPA Headquarters Building
1001 I Street
PO Box 4025
Sacramento, CA 95812-4025

RE: Section 2637(a)(6): comments on proposed language

Dear Mr. NeSmith:

We appreciate the opportunity to comment on the following proposed language, namely "Secondary containment systems where the continuous monitoring automatically monitors both primary and secondary containment, such as systems that are hydrostatically monitored or are under constant vacuum, are exempt from periodic secondary containment testing."

Our member company experience is that constant vacuum leak detection requires the permanent installation of an electrically operated vacuum pump and automatic vacuum sensing controls to maintain the "constant" vacuum. This approach is environmentally self-defeating in today's limited electrical energy environment. We recommend deleting "or are under constant vacuum".

The Fiberglass Tank & Pipe Institute is a trade association that represents the manufacturers of both tanks and piping used in underground and aboveground storage and handling facilities. In terms of market share, the year 2000 Havill market study shows that some 55% of the underground petroleum tanks in service at retail and commercial fueling facilities were manufactured by our members. In addition, non-metallic underground piping prevails at fueling facilities and our members manufactured the majority of this piping.

Member company experience with vacuum leak detection:

1. Cardinal Fibreglass Industries is an Institute member and manufacturers double-wall fiberglass tanks (FRP). Attached is a page from Cardinal's brochure showing their "Vacuum Leak Detector" which is listed by Underwriters Laboratories only for application with tanks up to 3,000 gallons in size. Experience shows that the vacuum will degrade and, to maintain a constant vacuum in the interstitial space, one needs to permanently install an electric vacuum sensor, electric vacuum pump and electric controls to run the pump and regenerate a vacuum in the interstitial space.

2. Both Containment Solutions and Xerxes Corporation are Institute members and manufacture double-wall FRP tanks up to 40,000 gallons in capacity. Often these tanks are held in inventory with a vacuum in the interstice, and the vacuum is used as a final check before shipment.

   Experience shows that vacuum will time-degrade in varying degrees depending on the size of the tank (i. e., vacuum degradation is a function of tank size; the larger the tank the more quickly vacuum will degrade). Thus, before shipping, these manufacturers recognize an allowable degradation depending on the storage time and tank size (i. e., when vacuum degradation is excessive, the tank is re-tested by the API and PEI 5-psi pressure and soaping method).
3. Institute members Containment Solutions and Xerxes have third party evaluated testing procedures, utilizing brine filled interstice, that will detect leak rates of 0.1 and 0.05 gallons per hour as required by the EPA and NFPA 329, respectively.
4. Customers often request that tank manufacturers pull a vacuum on the interstitial space before shipping to the installation job site. While experience shows that the vacuum will degrade, the time interval is short and certain AHJ officials accept limited degradation. However, it should be noted that FRP tank manufacturer installation instructions require the tank be properly tested with pressure and soap before installation, regardless of the vacuum level.

Industry experience with pressure and hydrostatic testing:

1. American Petroleum Institute recommended practices address the integrity testing of petroleum storage vessels and employ hydrostatic methods where practical. The main reason water is used in the hydrostatic test is to provide a 1.4 safety factor for this leak test (i. e., water is heavier [specific gravity of 1.0] than petroleum products [specific gravity of approximately 0.7]).
2. Institute members Containment Solutions and Xerxes Corporation recommend employing a brine solution in the interstice to provide an even greater 1.9 safety factor in the leak test (i. e., brine is heavier than water; specific gravity of 1.3). The other advantages of a brine filled interstice as a constant leak monitoring method is its low cost, low evaporation rate, freeze resistance, visual monitoring and it does not require the use of electrically operated leak detection devices.

In summary, we do not recommend that California include "constant vacuum" as a method to continuously monitor secondary containment systems. By including such a method, the state will encourage thousands of UST owners to install electrically operated vacuum pumps and controls to maintain the vacuum in double-wall tanks. This will promote the unnecessary consumption of electricity, when conservation of both water and electricity is important. B2-01

Sincerely,

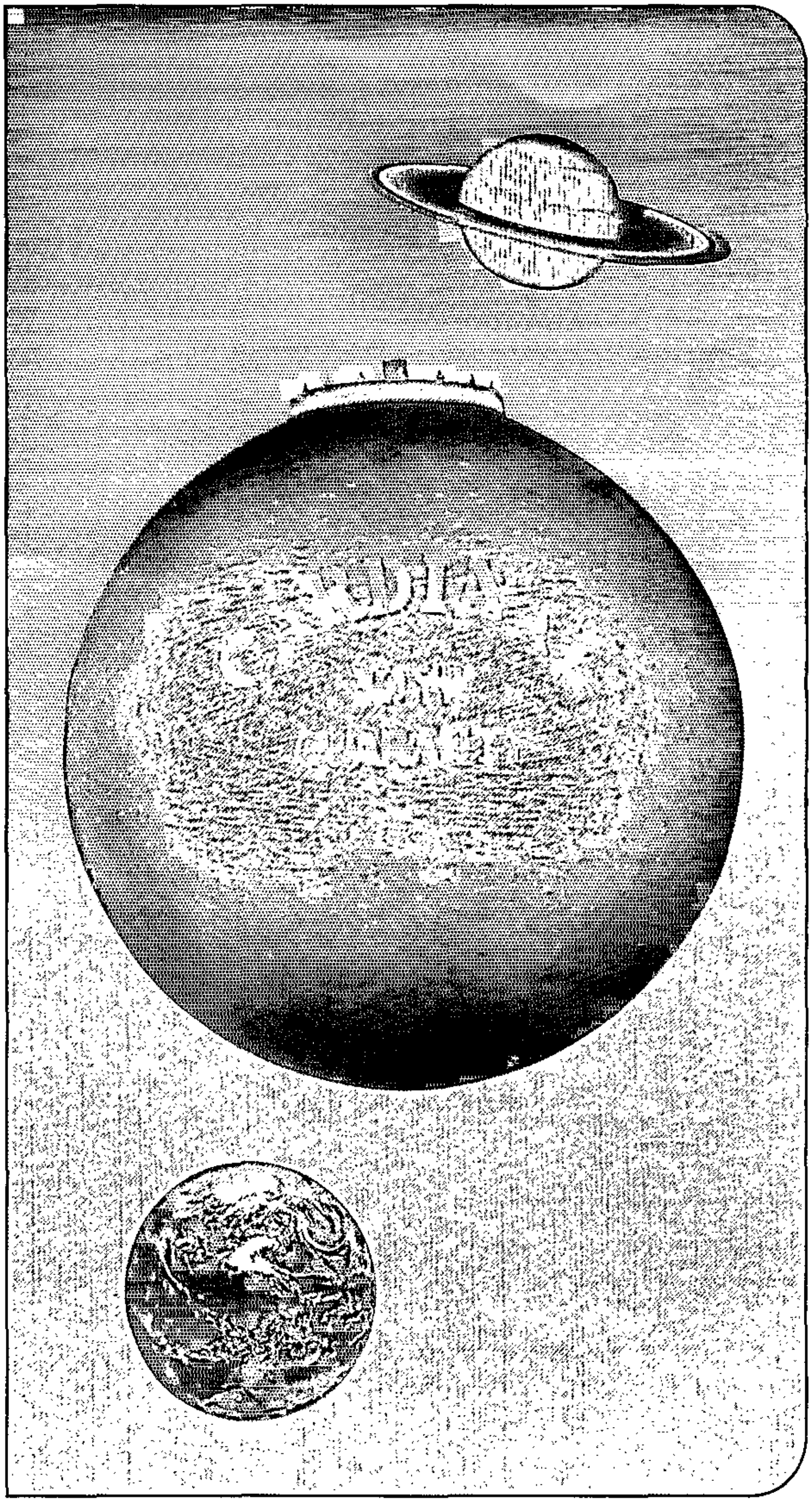
Attachment
CC: Mr. James S. White, White Environmental Associates, Brea, CA
Institute Members

FIBRETANK

BY CARDINAL FIBREGLASS INDUSTRIES

SPHERICAL, ONE PIECE, SEAMLESS FIBERGLASS

- STRONG SHAPE
- MONOLITHIC STRUCTURE
- SEAMLESS SPHERICAL
- ECONOMICAL INSTALLATION
- CORROSION RESISTANT INSIDE & OUT
- 285 TO 3000 GALLONS
- SINGLE WALL
- DOUBLE WALL
- FULL 30 YEAR WARRANTY



FIBRETANK

The New Generation Tank

CARDINAL has reshaped the underground fiberglass bulk liquid storage tank to achieve strength, durability, and economy unattainable with conventional designs.

QUALITY

Rigorous research, testing, and development have resulted in the CARDINAL FIBRETANK. Through a patented process, indestructable glass rovings are bonded with quality polyester resins to form an exceptionally strong seamless sphere which no other fiberglass configuration can equal.

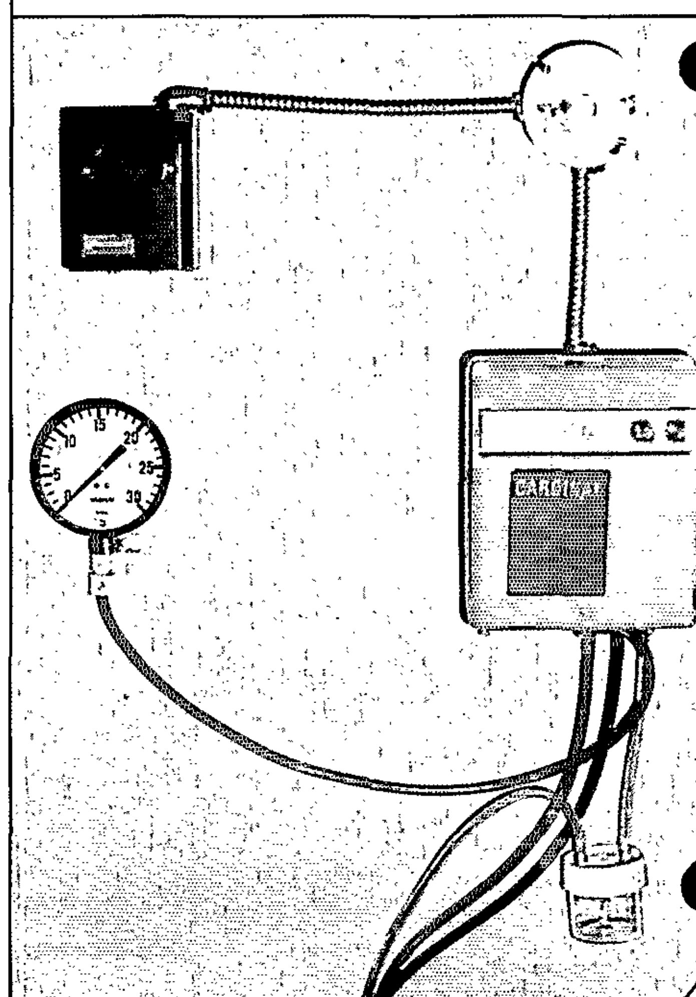
As a result, each and every CARDINAL FIBRETANK carries the UL label in recognition of the fact that it either meets or exceeds the stringent standards of Underwriters Laboratories for underground storage of petroleum products.

ECONOMY

Along with its other virtues, the spherical tank has the greatest volume to surface ratio possible. This compactness means less extensive (and expensive) excavations. All piping connections are clustered through the manhole, simplifying installation and preserving the integrity of the structure. In addition, the spherical design is simpler to fabricate, affording real dollar savings every step of the way, and making the CARDINAL FIBRETANK line the most price-competitive, cost-effective all fiberglass tanks in the industry.

ENVIRONMENTAL SAFETY

Rust-proof, corrosion resistant fiberglass tanks are a principal weapon in the battle to preserve the environment. Illustrated below is another CARDINAL innovation, the continuously monitoring Vacuum Leak Detector, intended for use with the CARDINAL Double-Wall FIBRETANK (see opposite page); an electronic guardian on duty 24 hours a day, seven days a week, against harmful pollution.



WSPA
Western States Petroleum Association

RECEIVED

JAN 26 2001

Division of Clean Water Programs

B3

Via Facsimile and First Class Mail

January 23, 2001

State Water Resources Control Board
Division of Clean Water Programs
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Attn: Mr. Charles NeSmith

Dear Mr. NeSmith:

WSPA COMMENTS on PROPOSED AMENDMENTS (JANUARY 9, 2001) to UST REGULATIONS

The Western States Petroleum Association (WSPA) is a trade association representing over thirty companies that produce, refine and market petroleum products in California. Many of our member companies operate UST systems that will be impacted by the proposed regulatory changes.

Our comment letter of January 8, 2001 stated our concern with the then-current requirement in Subsection 2637(a) to complete initial testing of secondarily-contained UST systems by January 1, 2002. WSPA thanks you for proposing a one-year extension (until January 1, 2003) of the deadline for conducting initial testing. We appreciate the opportunity to comment on this proposal.

In the Detailed Statement of Reasons for the proposed time extension, reference is made to the following:

1. The actual date that the amendments will become law is April 1, 2001 at the earliest.
2. The difficulty and complexity of recurrent testing.
3. The need to carefully work through numerous issues associated with the initial test.

We concur that these issues – particularly the three taken together – are ample justification for an extension of the compliance date for the initial testing. In theory, the proposed extended date allows at least eighteen months to perform initial testing. However, although the extra year is directionally very helpful, we continue to be concerned with the logistics of conducting initial testing at all affected sites by the newly-proposed January 1, 2003 deadline.

WSPA-member companies tend to own large numbers of RGOs – from several hundred to over one thousand. Thus, each of these companies would have to conduct initial tests, at as many as five sites, each and every business day through the end of December 2002. This would be a

505 No. Brand Blvd., Suite 1400 • Glendale, California 91203 • (818) 545-4105 • FAX: (818) 545-0954

significant challenge; the difficulties are these:

- Initial testing will be inherently more problematic than the recurring testing. For example, as noted in statement of reasons, there are various issues (e.g., the development of test methodologies and procedures) which need to be resolved before testing can actually begin.
- Testing of under-dispenser containment/control systems is a brand-new requirement involving equipment not previously subject to testing requirements.
- All owner/operators, including WSPA-member companies, will be competing for the same limited pool of outside resources (e.g., testing contractors, local-agencies, etc.).
- UST testing requirements will place significant additional demands on contractors, and it will take some time before these demands can be met. Many of the contractors, which RGO owner/operators would use for the additional testing of UST systems, also work on the vapor recovery systems – an area which has required a major recent increase in level of attention[1]. Other contractors have generally scaled-back their operations since the completion of the 1998 UST upgrades. Thus, we believe that virtually all contractors will need some time to staff-up in order to accommodate new UST testing requirements.

In view of these considerations, we believe that it would be appropriate to make the timing requirements for initial testing approximately the same as the requirements for recurring testing – that is, a three-year cycle. Thus, a most reasonable deadline for conducting initial testing would be January 1, 2004. We suggest this deadline because it would make for a much more manageable process while still providing environmental protection.

The deadline for installing under-dispenser containment/spill control, at sites which lack containment/control, is December 31, 2003. However, sites which already have containment/ control are currently offering a level of protection to the subsurface environment regardless of whether or not they are tested. Protection would not be lost by extending the deadline for initial testing to January 2004. B3-01

In order to ensure that the initial testing provides maximum environmental protection under our proposed "three-year" time-line, we would further suggest that an intermediate deadline (perhaps January 1, 2003) be set, and that all sites within 1000 feet of a public drinking water well be tested by that intermediate deadline. Owner/operators might be asked to file a testing plan with both the state and local agencies to demonstrate that they will be testing these sites first.

WSPA is seeking a manageable process for testing – particularly for the initial testing. Clearly, a more practical schedule is essential in this regard. We are also very interested in continuing to work the State Board to address the various issues which must be resolved before testing can commence.

---

[1] In Southern California, for example, the frequency for testing certain vapor recovery systems has increased twenty-fold.

We would be pleased to discuss any of these issues with you. Please do not hesitate to call me, 818/543-5324, with any questions that you may have.

Sincerely,

Ronald R. Wilkniss
South Coast Issues Coordinator

E. STUDIES RELIED ON

Winston H. Hickox
Secretary for
Environmental
Protection

State Water Resources Control Board

Division of Clean Water Programs
2014 T Street • Sacramento, California 95814 • (916) 227-4400
Mailing Address: P.O. Box 944212 • Sacramento, California • 94244-2120
FAX (916) 227-4349 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

July 13, 1999

To: CALM work group members and selected review team

These documents and proposed regulatory language have been developed by a team of local agency inspectors (CALM work group). These inspectors (listed in Enclosure 1) have graciously volunteered their time and their agencies have dedicated resources to help us with this project. Please send your comments to Shahla Farahnak, Senior Engineer, lead for the CALM work group, by August 6, 1999.

Enclosed for your review and comments are the following **draft** documents:

- Enclosure 2 – Monitoring System Certification
- Enclosure 3 – Third Party Monitoring Guidelines
- Enclosure 4 – CALM work group's suggested language for the UST regulations
- Enclosure 5 – Proposed language in SB 989 pertaining to license requirements for service contractors

If you have any questions or need additional time for review please call Shahla Farahnak at (916) 227-4350 or any of the members of the CALM workgroup.

Sincerely,

Shahla Farahnak

Shahla Farahnak, Senior Engineer
Division of Clean Water Programs

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MONITORING SYSTEM CERTIFICATION

Enclosure 2

For Use By All Jurisdictions Within the State of California
Authority Cited: Chapter 6.7, Health and Safety Code; Chapter 16, Division 3, Title 23, California Code of Regulations

This form must be used to document testing and servicing of monitoring equipment. If more than one monitoring system control panel is installed at the facility, a separate certification or report must be prepared for each monitoring system control panel by the technician who performs the work. A copy of this form must be provided to the tank system owner/operator. The owner/operator must submit a copy of this form to the local agency regulating UST systems within 30 days of test date. Instructions are printed on the back of this page.

A. General Information

Facility Name: ______________________________ Bldg. No.: __________

Site Address: ______________________________ City: ______________ Zip: __________

Facility Contact Person: ______________________________ Contact Phone No.: (_____) ______________

Make/Model of Monitoring System: ______________________________ Date of Testing/Servicing: ___/___/___

B. Inventory of Equipment Tested/Certified

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Check the appropriate boxes to indicate specific equipment inspected/serviced:

Tank ID: ______________________________
- ❑ In-Tank Gauging Probe. Model: __________
- ❑ Annular Space or Vault Sensor. Model: __________
- ❑ Piping Sump/Trench Sensor(s). Model: __________
- ❑ Fill Sump Sensor(s). Model: __________
- ❑ Mechanical Line Leak Detector. Model: __________
- ❑ Electronic Line Leak Detector. Model: __________
- ❑ Tank Overfill / High-Level Sensor. Model: __________
- ❑ Dispenser Containment Sensor(s). Model: __________
- ❑ Shear Valve(s).
- ❑ Dispenser Containment Float(s) and Chain(s).
- ❑ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________________
- ❑ In-Tank Gauging Probe. Model: __________
- ❑ Annular Space or Vault Sensor. Model: __________
- ❑ Piping Sump/Trench Sensor(s). Model: __________
- ❑ Fill Sump Sensor(s). Model: __________
- ❑ Mechanical Line Leak Detector. Model: __________
- ❑ Electronic Line Leak Detector. Model: __________
- ❑ Tank Overfill / High-Level Sensor. Model: __________
- ❑ Dispenser Containment Sensor(s). Model: __________
- ❑ Shear Valve(s).
- ❑ Dispenser Containment Float(s) and Chain(s).
- ❑ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________________
- ❑ In-Tank Gauging Probe. Model: __________
- ❑ Annular Space or Vault Sensor. Model: __________
- ❑ Piping Sump/Trench Sensor(s). Model: __________
- ❑ Fill Sump Sensor(s). Model: __________
- ❑ Mechanical Line Leak Detector. Model: __________
- ❑ Electronic Line Leak Detector. Model: __________
- ❑ Tank Overfill / High-Level Sensor. Model: __________
- ❑ Dispenser Containment Sensor(s). Model: __________
- ❑ Shear Valve(s).
- ❑ Dispenser Containment Float(s) and Chain(s).
- ❑ Other (specify equipment type and model in Section E on Page 2).

Tank ID: ______________________________
- ❑ In-Tank Gauging Probe. Model: __________
- ❑ Annular Space or Vault Sensor. Model: __________
- ❑ Piping Sump/Trench Sensor(s). Model: __________
- ❑ Fill Sump Sensor(s). Model: __________
- ❑ Mechanical Line Leak Detector. Model: __________
- ❑ Electronic Line Leak Detector. Model: __________
- ❑ Tank Overfill / High-Level Sensor. Model: __________
- ❑ Dispenser Containment Sensor(s). Model: __________
- ❑ Shear Valve(s).
- ❑ Dispenser Containment Float(s) and Chain(s).
- ❑ Other (specify equipment type and model in Section E on Page 2).

C. Certification

- I certify that the equipment identified in this document was inspected/serviced in accordance with the manufacturers' guidelines. Attached to this Certification is information (e.g. manufacturers' checklists) necessary to verify that this information is correct and a Site Plan showing the layout of monitoring equipment. For any equipment capable of generating such reports, I have also attached a copy of the *(check all that apply)*:
- ❑ **System set-up report;**
- ❑ **Alarm history report.**

Technician Name (print): ______________________ Cert./Lic. No.: __________ Signature: ______________________

Testing Company Name: ______________________________ Phone No.: (_____) ______________

UST Monitoring Site Plan

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lity Name: ______________________________

Date map was drawn: ___/___/___.

Instructions

If you already have a diagram that shows all required information, you may include it, rather than this page, with your Monitoring System Certification. On your site plan, show the general layout of tanks and piping. Clearly identify locations of the following equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas; mechanical or electronic line leak detectors; and in-tank liquid level probes (if used for leak detection). In the e provided, note the date this Site Plan was prepared.

Instructions for Equipment Testing and Certification

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General Instructions

1. Equipment that monitors underground storage tank systems containing hazardous materials must be tested/serviced annually, or on a schedule specified by the manufacturer, whichever is more frequent.

2. This certification form must be used to document the following activities: 1.) Periodic testing as described above; 2.) Testing of new monitoring systems upon installation; 3.) Testing of replacement sensors, probes, or other system components; and 4.) Testing of repaired sensors, probes, or other system components.

3. As noted on Page 1, a separate certification form must be competed for each individual monitoring system control panel. For example: If one control panel monitors in-tank gauging probes and another panel monitors electronic line leak detectors, two certification forms would be required.

4. Be aware that many local agencies require that a permit be obtained <u>prior</u> to installing new monitoring systems or components. Check with your local agency for their requirements before starting work.

Section B

1. In the Tank ID sections, describe which tanks you worked on (e.g. Diesel Tank, North Tank, Middle Tank).

2. For compartmented tanks, list each compartment as a separate tank.

3. Where "Model" is asked for, the name of the manufacturer and the manufacturer's specific model name or number, as referenced in the "List of Leak Detection Equipment and Methods for Underground Storage Tanks" (i.e. LG-113) must be specified.

4. Hands-on functional testing of individual leak detection components to confirm operability to manufacturer's specifications and state regulations is required. This includes verifying any automatic shut-off features. In the case of sensors that can not be non-destructively tested, contact your local agency that regulates UST systems to see if they will approve alternate testing methods (e.g. testing of representative samples).

Section C

1. Certification must be made by a state-registered technician.

2. All work associated with testing/servicing of equipment must be performed by or under the direct supervision of the certifying technician.

Section D

1. Leak sensors must be reinstalled at the low points of the secondary containment systems they monitor and positioned so that other equipment will not interfere with their proper operation.

2. When testing operability of positive turbine shut-down, you must: 1.) verify shut-down by simulating a leak; <u>and</u> 2.) verify shut-down by disconnecting the sensor.

Site Plan

You must attach a Site Plan showing the general layout of tanks and piping. Clearly identify locations of the following equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas; mechanical or electronic line leak detectors; and in-tank liquid level probes (if used for leak detection). Note the date the Site Plan was prepared.

Facility Name: ______________________ Date of Testing/Servicing: ___/___/___

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D. Results of Testing/Servicing

Complete the following checklist:

❑ Yes	❑ No*	Is the monitoring system operational per manufacturer's specifications?
❑ Yes	❑ No*	Is the audible alarm operational?
❑ Yes	❑ No*	Is the visual alarm operational?
❑ Yes	❑ No*	Were all sensors visually inspected, tested, and confirmed operational?
❑ Yes	❑ No*	Were all sensors and probes reinstalled properly?
❑ Yes	❑ No*	Is all monitoring equipment secured from unauthorized tampering?
❑ Yes	❑ No* ❑ N/A	If alarms are relayed to a remote monitoring station, is all communications equipment (e.g. modem) operational?
❑ Yes	❑ No* ❑ N/A	If needed by any monitoring equipment, are replacement fuses and/or batteries available?
❑ Yes	❑ No* ❑ N/A	For pressurized piping systems, does the turbine automatically shut down if the piping secondary containment monitoring system detects a leak, fails to operate, or is electrically disconnected? If yes: which sensors initiate positive shut-down? *(Check all that apply)* ❑ Sump/Trench Sensors; ❑ Dispenser Containment Sensors. Did you confirm positive shut-down due to leaks <u>and</u> sensor failure/disconnection? ❑ Yes; ❑ No.
❑ Yes	❑ No* ❑ N/A	For monitoring systems that also serve as tank overfill warning devices, is the overfill warning alarm visible and audible at the tank fill point(s) and operating properly? If so, at what percent of tank capacity does the alarm trigger? _______%
❑ Yes*	❑ No	Was any monitoring equipment replaced? If yes, identify specific sensors, probes, or other equipment replaced and list the manufacturer name and model for all replacement parts in Section E, below.
❑ Yes	❑ No	Was any system software upgraded? If yes, identify the new version number in Section E, below.
❑ Yes*	❑ No	Was liquid found inside any secondary containment systems? *(Check all that apply)* ❑ Product; ❑ Water. If yes, describe causes in Section E, below.

*** In Section E below, describe how and when these deficiencies were or will be corrected.**

E. Comments: ______________________________

Page 3 of this Certification must be completed and attached only if one or more of the following conditions are met: 1.) In-tank gauging equipment is used to perform leak detection monitoring; 2.) Line leak detectors are installed on piping systems; 3.) Completion is required by your local agency that regulates UST systems.

Facility Name: ______________________________ Date of Testing/Servicing: ___/___/___

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F. In-Tank Gauging Equipment:

❑ Check this box if tank gauging is used only for inventory control.

This section must be completed if in-tank gauging equipment is used to perform leak detection monitoring.

Software Version Installed: ______________________

Complete the following checklist:

❑ Yes	❑ No*	Has all input wiring been inspected for proper entry and termination, including testing for ground faults?
❑ Yes	❑ No*	Were all tank gauging probes visually inspected for damage and residue buildup?
❑ Yes	❑ No*	Was accuracy of system product/waste level readings tested?
❑ Yes	❑ No*	Was accuracy of system water level readings tested?
❑ Yes	❑ No*	Were all alarms activated and did they function properly?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

G. Line Leak Detectors (LLD):

❑ Check this box if LLDs are not installed.

Complete the following checklist:

❑ Yes	❑ No*	Was a leak simulated to verify LLD performance? *(Check all that apply)* Simulated leak rate: ❑ 3 g.p.h.; ❑ 0.1 g.p.h.; ❑ 0.2 g.p.h.
❑ Yes	❑ No*	Were all LLDs confirmed operational and accurate within regulatory requirements?
❑ Yes	❑ No*	Was the testing apparatus properly calibrated?
❑ Yes	❑ No* ❑ N/A	For mechanical LLDs, does the LLD restrict product flow if it detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if the LLD detects a leak?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system is disabled or disconnected?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, does the turbine automatically shut off if any portion of the monitoring system malfunctions or fails a test?
❑ Yes	❑ No* ❑ N/A	For electronic LLDs, have all accessible wiring connections been visually inspected?
❑ Yes	❑ No* ❑ N/A	If necessary to proper equipment operation, are fuel filters in good condition?
❑ Yes	❑ No*	Were all items on the equipment manufacturer's maintenance checklist completed?

*** In the Section H, below, describe how and when these deficiencies were or will be corrected.**

H. Comments: ______________________________

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THIRD PARTY MONITORING GUIDELINES

What is Third Party Monitoring?

Underground storage tank third party monitoring is defined as remote monitoring of leak detection equipment, where a transfer of data is collected by a third party, who is then in turn providing compliance reports to the tank owner/operator. This definition also includes the modification of leak detection equipment for the purpose of a third party to remotely monitor the leak detection equipment. A modification of the leak detection system is such that the leak detection equipment provides limited on site access, including but not limited to, ability to view current system status, ability to obtain alarm history reports, the disabling of on-site alarms, or the ability to retain data.

Responsibilities

The owner/operator of an underground storage tank is responsible for meting all operating and reporting requirements under federal, state, and local laws.

Owner/operator is responsible for submitting a written monitoring program and response plan to the local agency. A written monitoring program shall be developed for both third party monitoring and on-site monitoring, in case of a failure in communication or data transfer. This written monitoring program shall conform to the standards set forth in all federal, state and local laws. In addition this document shall identify the third party monitoring company, methods by which leak detection equipment will be monitored, how alarm conditions are to be recorded, identification of party responsible for responding to alarm conditions, actions taken in response to on site alarm conditions, identification of communications or data transfer, responsibility of availability of monthly monitoring reports, the format in which leak detection data will be recorded, designated party (name, title, and representing company) who is responsible for annual maintenance check.

Owner/operators shall recognize that a failure in communication or data transfer with a third party monitoring company does not relieve them of any responsibility. In the case of a communication error between the continuous monitoring system and the third party monitoring company, the monitoring system shall revert to on-site continuous monitoring in a standard operating mode.

Owner/operator is responsible for notifying the local agency with in 24 hours after an unauthorized release or condition has been detected, or should have been detected. An unauthorized release is defined as a release which escapes from the secondary containment, or from the primary containment, if no secondary containment exists, increases the hazard of fire or explosion, or causes any deterioration of the secondary containment of the underground storage tank system.

Owner/operator shall maintain all monitoring and maintenance reports on site or off site at a readily available location, if approved by the local agency, for at least 3 years, 6 1/2 years for cathodic protection maintenance records, and 5 years for written performance claims pertaining to release detection systems, and calibration and maintenance records for such systems.

Owner/operator is responsible for obtaining a permit and/or prior approval from the local agency prior to implementing the services of a third party monitoring company. Software upgrades may also require permits and/or prior approval.

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MINIMUM STANDARDS FOR THIRD PARTY MONITORING

On-Site Alarm Conditions - The following alarm conditions shall have an audible and visual alarm on site:

1. Sump and dispenser containment, high liquid alarm
2. Fuel/liquid alarm (sensors that do not discriminate)
3. Positive turbine shutdown
4. Overfill alarm
5. Communications error

Reports - Monthly reports shall include the following information:

1. Underground storage tank owner/operator, facility address, date printed, and clearly identify third party monitoring company name address and phone number.
2. All data shall be identified by Tank ID, product and size, date, and test method (leak rate).
3. Results of in-tank testing (if used as primary source of leak detection): reporting format for automatic tank gauging and continuous in-tank leak detection shall conform to the requirements of all federal, state, and local laws.
4. Piping test results: line leak detection results either .2 gallons per hour or .1 gallons per hour.
5. Alarm history reports indicating potential releases, the integrity of underground storage tank system, and/or equipment failure shall include data on the date and time alarm condition occurred, alarm type/description, dispatch company, description of how the alarm condition was resolved, the date the alarm condition was cleared.
6. Daily sensor status of all individual leak detection equipment.

Interrogations Software - All leak detection systems shall be interrogated daily by the third party monitoring company.

A statement from the third party monitoring company identifying the version of software implemented at the site and that the version of software is consistent with the minimum established third party guidelines. A list of software versions and capabilities of those versions shall be available for review.

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Enclosure 4

CALM work group's suggested language for the UST regulations as they pertain to underground storage tank (UST) system leak detection equipment annual maintenance check training and licensing requirements for contractors.

- Definition - "industry-established training standards" means training standards and/or certification requirements set forth by the manufacturer of the monitoring equipment to include, but not limited to, recertification requirements.

- Any person who certifies UST monitoring equipment must be certified every two years, or as per manufacturer's specification, whichever is more stringent.

- The Board shall maintain a master list of qualified persons who have completed certification requirements for specific equipment. This list shall be updated at least bi-annually and shall be readily accessible to all interested parties. This list shall include, but is not limited to, the name of the person who is certified, the person's state registration number issued by the Board, the manufacturers' training standards/certifications the person has completed and the recertification dates for each manufacturer.

- Persons not on the Board's master list shall provide documentation to the local agency demonstrating that they meet the "industry-established training standards" to the local agency upon request.

- All persons installing, repairing, maintaining, or calibrating monitoring equipment shall report results of such work on the state "Monitoring System Certification" form.

- UST Owners/operators shall submit a completed "Monitoring System Certification" form to the local agency within 30 days of the installation, repair, maintenance, or calibration of the monitoring equipment.

- All persons installing, repairing, replacing, or calibrating UST monitoring equipment shall affix a tag/sticker on each leak detection component that is installed, repaired, replaced, or calibrated. The tag/sticker shall be placed in a readily visible location and shall include the date the UST component was installed, repaired, replaced, or calibrated.

- The underground storage tank owner or operator shall notify the local agency 48 hours before conducting an installation, repair, replacement, or calibration of monitoring equipment unless the notification requirement is waved by the local agency.

Enclosure 5

Proposed language in AB 989 pertaining to license requirements for service contractors:

(c) After January 1, 2001, no person shall install, repair, maintain, or calibrate monitoring equipment for an underground storage tank system unless the person responsible for providing the service:
(1) has fulfilled the industry-established training standards identified by the board in regulations adopted pursuant to section 25284.1, subdivision (a)(4), and
(2) posses one of the following licenses: C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors License Board.

DRAFT

October 29, 1999

Secondary Containment Testing

BACKGROUND: On October 8, 1999, Governor Davis signed SB 989 into law, prompting the State Water Resources Control Board to address the issue of secondary containment in underground storage tank (UST) systems. The pertinent language of the bill is as follows:

> 25284.1. (a) The (State Water Resources Control) board shall take all of the following actions with regard to the prevention of unauthorized releases from petroleum underground storage tanks:
>
> 25284.1 4 (b) Require testing of the secondary containment components, including under-dispenser and pump turbine containment components, upon initial installation of a secondary containment component and periodically thereafter, to ensure that the system is capable of containing releases from the primary containment until a release is detected and cleaned up. The board shall consult with the petroleum industry and local government to assess the appropriate test or tests that would comply with this subparagraph.

A large number of UST sites employ secondary containment (in the form of double walled tanks and piping) as a leak prevention system. Product leaking from the inner tank/piping will flow toward a sensor and trigger an alarm. This system relies on the outer wall of the tank or piping to transmit the leaking product toward the sensor. However, it is possible to have a break in the outer wall such that product leaking from the inner tank/piping would be released into the environment rather than activating the sensor. Periodic inspection of secondary containment is intended to detect this condition and prevent the resultant environmental damage.

SUMMARY OF SURVEY: SWRCB recently conducted a survey of UST contractors and local regulatory agencies regarding the periodic testing of secondary containment systems. The survey (attachment 1) was distributed to members of the petroleum industry and officials of local regulatory agencies knowledgeable with UST systems (see attachment 2 for survey distribution list). 12 completed surveys were returned, and the results are summarized below.

- <u>Frequency Of Testing:</u> Nearly half of the respondents believe testing should occur annually. The majority of others recommended testing every 2-5 years. The maximum interval suggested was 10 years. Only one respondent stated that testing would be unnecessary.

- <u>Test Method:</u> Recommended test methods varied depending on the respondent and the particular UST component tested. Common responses included hydrostatic testing for sumps, pressure testing for piping, and pressure or hydrostatic testing for tanks. Respondents were split fairly evenly on the issue of third party certification for testing methods.

- Who Should Conduct Testing: 75% of the respondents believed testing should be conducted by an independent contractor. 25% stated that both independent contractors and a tank owner's maintenance staff should be allowed to conduct testing.

- Systems That Can Not Be Tested: Nearly half of the respondents indicated that there are some circumstances that would make testing impossible. Some older systems may not have access to all secondary containment test fittings. Lined excavation systems may also be impractical or impossible to test.

- Cost Impact: Cost of secondary containment testing would vary depending on the particular UST system and inspector. Each component of the secondary containment system that requires testing would add to the overall cost. Prices range from $1680 to $4597 for a typical service station (average station is assumed to have 3 tanks, 8 dispensers, and associated sumps and piping). The average for the typical station is approximately $2500. Cost would be higher for UST systems with more dispensers and piping, lower for single-product and low-volume UST systems. See attachment 3 for a complete summary of the cost survey, including costs for individual components of a UST system.

RECOMMENDATIONS: Based on the results of this survey and experience with UST systems, the SWRCB recommends that regulations be drafted to require testing of secondary containment upon completion of construction, six months after UST operation begins, and once every three years thereafter. This requirement should be limited to UST systems for which the integrity of the secondary containment is critical to the detection of leaks, and which include no means of continuously monitoring the integrity of the secondary containment. These regulations should also establish a definition for qualified independent contractors who would perform the tests. Additionally, appropriate testing procedures must be specified. The cost associated with implementing these proposed regulations is justified by the added protection against leaks that secondary containment testing would provide. These regulations will ensure that secondary containment systems currently required by law will perform as intended.

A brief justification for each recommended regulation is provided below.

FREQUENCY:

1. **Test at time of UST installation.**
   - Testing at the time of installation will ensure secondary containment is tight upon initial delivery of product. Any factory defects or damage during shipping can be detected and remedied at this time. This is

currently required per CCR Title 23, Division 3, Chapter 16, Section 2635

2. **Test at 6 months after initial product delivery**
   - Testing at 6 months will verify that factors such as settling in the backfill material, installation errors, and separated connections have not compromised the integrity of the UST. These factors are most likely to occur in the first 6 months of tank operation.

3. **Testing every 3 years thereafter.**
   - Testing every three years thereafter will provide continuing protection against undetected leaks from secondary containment systems. The majority of those surveyed indicated that annual testing would be most effective. However, testing every three years would provide sufficient protection for the environment, while still being cost feasible for tank owners who would have to pay for testing over the life of the UST. Additionally, this frequency would coincide with cathodic protection testing currently required.

WHO SHOULD CONDUCT TESTING:

1. **A licensed tank tester should perform testing.**
   - All precision tank testing in California must currently be performed by a licensed tank tester. Secondary containment testing should fall under these guidelines.

TEST METHOD:

1. **Testing procedures should be as specified for initial installation testing.**
   - CCR, Title 23, Chapter 16, Article 3, Section 2635 mandates testing of secondary containment upon installation. Local agencies are responsible for the specifics of this testing, and we recommend the same procedure be followed for periodic secondary containment testing as well.

Attachment 1

Secondary Containment Testing Survey

I am writing on the subject of proposed periodic testing of secondary containment systems (including interstitial space of the tank, all sumps, dispenser containment boxes, and spill boxes). Mr. Chuck Nesmith of our office is coordinating the 1998/99 regulatory revisions. I am working with Chuck on the language and details of secondary containment testing. I would like your assistance by providing the following information, which will help us evaluate the feasibility and cost of requiring such testing. This is just an informal inquiry sent to select contractors and vendors. Regulations will be subject to the normal course of public comment.

1. In your opinion is periodic testing of secondary containment necessary? **Y / N**

   If yes how often? ____________________

2. Do you currently perform the annual leak detection equipment certification required by the State of California? **Y / N**

   What is the market price range (not specifically what you charge) for this kind of service for a three-tank double-wall site? ____________________

3. Have you ever performed periodic testing of secondary containment for customers? **Y / N**

   Comments____________________

4. To your knowledge, are there any circumstances or systems for which this testing may not be possible or feasible? **Y / N**

   If yes, what are some examples? ____________________

   ____

5. In your opinion, annual leak detection certification and periodic secondary containment testing should be performed by:
   A) an independent contractor
   B) a tank owner's qualified maintenance staff
   C) both independent contractors and a tank owner's maintenance staff should be allowed to conduct testing

Comments?

____

____

____

____

____

Please provide the following information or attach a business card.

NAME: ____________________ ADDRESS: ____________________

PHONE: ____________________ FAX: ____________________

E-MAIL: ____________________

SURVEY CONTINUES ON NEXT PAGE

Would you please give us your recommendation on the following items

	Under dispenser box	Secondary flexible piping	Secondary fiberglass piping	Pump Sump	Fiber Trench
Recommended test method / procedure					
Need for third party certification of the method (Yes / No)					
What standard, criteria or threshold should be used					
Contractor qualifications needed					
Reasonable cost for this kind of testing					

	Fill Sump	Vapor Recovery Sump	Spill Box	Tanks with Bladder as the primary
Recommended test method / procedure				
Need for third party certification of the method (Yes / No)				
What standard, criteria or threshold should be used				
Contractor qualifications needed				
Reasonable cost for this kind of testing				

	Fiberglass brine-filled tanks	Fiberglass dry-space DW tanks	DW steel tanks and jacketed tanks	Tanks with vacuum in the interstitial space
Recommended test method / procedure				
Need for third party certification of the method (Yes / No)				
What standard, criteria or threshold should be used				
Contractor qualifications needed				
Reasonable cost for this kind of testing				

Please fax your response to Shahla Farahnak at (916) 227-4349. Attach additional sheets if necessary.

Secondary Containment Testing Survey
Distribution List

Marcel Moreau
Marcel Moreau Associates
207-274-9263

Bart Scowley
Shield Sharper
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Oakland, CA 94611
510-653-9119
510-658-8448 (fax)

Valley Petroleum Equipment, Inc.
P.O. Box 398
El Centro, CA 92244
760-355-4230
760-352-1713

Advanced Petroleum Corporation
7090 Archibald Ave, Suite B
Rancho Cucamonga, CA 91709
909-466-9914
909-466-9815

Jerry Belloli
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1420 W. Kettleman Lane, Suite T
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800-964-0180
203-365-1543 (fax)

Anaheim Fire Prevention
714-765-4608

Mike Lesley
Triangle Environmental, Inc.
2525 W. Burbank Blvd.
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West Sacramento, CA 95691
916-372-1985
916-372-0911 (fax)

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916-258-8704 (fax)

Louise-Phillipe Rooms
Tank-Tek Environmental Corporation
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707-446-6192 (fax)

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State of Montana Dept. of
Environmental Quality
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Helena, MT 59620-0901
406-444-1417

Sandy Tosch
Indio Environmental Health
760-863-8303 (fax)

Attachment 3 --
Secondary Containment Testing Survey Cost Assesment Summary

	Under Dispenser Box (each)	Secondary Flex Piping (per line)	Secondary Fiberglass Piping (per line)	Pump Sump (each)	Fill Sump (each)	Vapor Recovery Sump	Spill Box (each)	Bladder Tanks	Fiberglass Brine-filled tanks	Fiberglass Dry-space Tanks	DW Steel and jacketed tanks	Tanks w/ Vacum in the Interstitial Space
Bart Scowley	45	100	100	60	60	0	30	NA	300	300	300	NA
Valley Petroleum Equipment incorporated	100	120	100	150	40	40	40	NA	80	200	200	
Tanknology (Jerry Belloli)	25	100	100	66	66	66	50	NA	NA	400	400	NA
Triangle Environmental, Inc. - Michael Lessley	75	75	75	100	100	100	50	100	NA	100	100	NA
Fillner Construction -- Steve L. Welge	60	100	100	100					100	100	100	NA
Advance Petroleum Corp. (Mr. Allen Roach)	50	100	100	133	133	133	133	NA	666	666	666	666
Champion tank Testing -- William Galli												
Tank-Tek -- Phil Rooms	125	200	200	333	0	133		333	100	333	333	750
HIGH VALUE	125	200	200	333	133	133	133	333	666	666	666	750
LOW VALUE	25	75	75	40	0	0	30	100	100	100	100	666
AVERAGES	68.57143	113.57143	110.71429	134.6	66.5	78.66667	60.6	216.5	249.2	299.8571	299.8571	708

grey cells were given as costs for a total UST system, and have been calculated based on an "average" UST system

An "average" UST is assumed to have 3 tanks, 8 dispensers, and corresponding sumps and piping.

Attachment 3 --
Secondary Containment Testing Survey Cost Assesment Summary

Total for Dispenser	Total for Piping	Total for Sumps	Total for Tanks	Total for UST	
360	600	360	900	2220	Bart Scowley
800	600	690	600	2690	Valley Petroleum Equipment incorporated
200	600	594	1200	2594	Tanknology (Jerry Belloli)
600	450	900	300	2250	Triangle Environmental, Inc. - Michael Lessley
480	600	300	300	1680	Fillner Construction -- Steve L. Welge
400	600	1197	1998	4195	Advance Petroleum Corp. (Mr. Allen Roach)
				350	Champion tank Testing -- William Galli
1000	1200	1398	999	4597	Tank-Tek -- Phill Rooms
1000	1200	1398	1998	4597	
200	450	300	300	1680	
548.571429	664.2857	777	899.5714	2572	

grey cells were given as costs for a total UST system, and have been calculated based on an "average" UST system

An "av[illegible]ge" UST is assumed to have 3 tanks, 8 dispensers, and correspon[illegible] sumps and piping.

STATE WATER RESOURCES CONTROL BOARD'S ADVISORY PANEL ON THE LEAK HISTORY OF NEW AND UPGRADED UST SYSTEMS

LEAK SOURCE AND LEAK DETECTION DATA COLLECTION AND ANALYSIS
(UST Team 3 Report)

MARCH 1999

PARTICIPATING TEAM 3 MEMBERS:

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Jim Smith, San Bernardino County Environmental Health Services
John White, Anaheim Fire Department

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD:
Allan Patton, Advisory Panel Chairperson
Shahla D. Farahnak, P.E., Project Manager and UST Workgroup Chairperson
Mary Drewry, Staff Engineer

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I. PURPOSE

The central question examined by the entire panel was whether the standards for new and upgraded UST systems are adequate to protect water resources from MTBE contamination. Team 3 contributed to this effort by gathering data intended to help answer the following more specific questions:

1. Are releases primarily from new, upgraded or non-compliant UST systems?
2. Which portion(s) of the UST system are most likely to fail?
3. How do releases get discovered?
4. How big is the problem before it is discovered?

II. STUDY APPROACH

The goal of the team was to gather data related to the above questions for as many UST systems as possible. Two distinct but similar data sources were examined. The first source was a subset of the most recent petroleum releases recorded in the State Water Resources Control Board's Leaking Underground Storage Tank Inventory System (LUSTIS). A total of 1691 reported releases during the period June 1, 1996 to July 1, 1998 were considered in this study. Advantages of the database include the fact that it is comprehensive and is easily accessible. Disadvantages include the fact that it only includes systems that have reported a release, and that it does not provide all information necessary to address the questions above. For example, the database contains no information on whether the facility was using a release detection system when the leak was discovered and has no information on dispenser or turbine containment systems that might have been in use.

To gather necessary information not originally reported in the LUSTIS database staff members from SWRCB and local agencies reviewed the original files of cases reported as leaking during this period. A total of 1072 of the 1691 records were reviewed and these records form the basis for all subsequent analysis of the LUSTIS-extracted records. An example of the form used to collect the additional data from the files is included in appendix A-1.

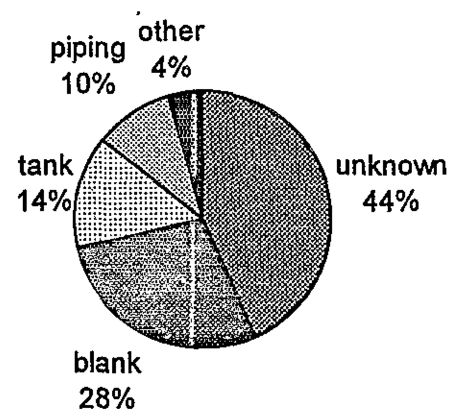
Historical files for release sites frequently lack some of the desired information, even upon careful review. Consequently, the team devised a second data gathering effort that relied upon local agency inspectors to collect the desired information when performing system inspections at tank closure, upgrade or any other time when the excavation was open for visible examination. A data collection form similar to that used for the LUSTIS file review was designed by the team (Appendix A-2). Team members took the lead in coordinating data gathering and reviewing this information. A total of 235 sites were inspected during this effort. The following counties had more than five sites included in the database: Alameda, Butte, Fresno, Humboldt, Los Angeles, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Joaquin, and Shasta. Advantages of the inspection database are that it included sites with and without releases, and that the information tends to be more complete because it was compiled on-site when questions could be answered by a visual inspection. Even for these sites, however, the desired information was not complete in many cases. The most common missing element was leak detection information when it was not readily available to the inspector at the site.

III. RESULTS

A. LUSTIS file review

The distribution of release sources in the 1072 LUSTIS database records examined is summarized in Figure 1. Only 24% of the releases were attributed to either the tank or piping, with the remaining 76% classified as "unknown", "other" or left blank on the reporting form. The characteristics of the 155 tanks reported to be the source of releases is detailed in Table 1. The majority (78.7%) of the tanks reported as leaking were bare steel, single-walled tanks that do not comply with current regulations. Only 12.2% of the tanks were of a material considered to be "non-corrosive" and 7.1% were double walled. Most (89%) of the tanks were over 15 years old or were of indeterminate age; 11% were between 0-15 years old. Few leaks in these systems (4.5%) were discovered by routine leak detection activities. Clearly, most tank releases are occurring in tanks that do not meet the definition of "upgraded" under current SWRCB regulations.

Figure 1. Release sources reported in LUSTIS review



A similar analysis was performed to determine the characteristics of UST piping at those sites with piping as the reported release source. Table 2 summarizes the major design and operation features of the 108 piping systems identified as release points. A greater percentage (29.7%) of these is constructed of "non-corrosive" material than in the tank case, but over 50% are still bare steel. Double-walled piping was reported to be the source of 19.4% of the piping releases, and most of the systems (90.8%) had either no or unknown containment at the turbine or the dispenser. Submersible pumps were nearly twice as common as suction systems among the leaking systems. Few leaks in these systems (6.5%) were discovered by routine leak detection activities. Piping over 11 years old represented 87% of this group of systems. Once again, the picture that emerges is one in which the systems that leak are predominantly those failing to meet current regulatory standards for piping design and operation.

Routine monitoring of a UST system to provide early warning of a release is one of the most important protections in the regulation, particularly for single walled systems. An earlier report by SWRCB[1] indicated that only 5% of releases were discovered by leak detection and that the vast majority (84.7%) remained undetected until tank closure. Results from this study support these earlier conclusions, with only 4.5% of tank releases and 6.5% of piping releases identified by leak detection methods. Tank closure or removal continued to be the most important means of detecting a leak, with 77.4% of tank releases and 49.1% of piping releases discovered in this manner.

To explore the reasons for the apparently poor performance of leak detection, the present study sought information on which, if any, release detection methods were in use at the time of closure or release. Table 3 summarizes this information and shows that most UST systems in the LUSTIS database are not complying with leak detection requirements. Over 40% of the systems have no dedicated tank leak detection and 56.8% lack piping leak detection. For the systems that have performed leak detection, precision tank and piping tests are the most common methods, utilized by 49.7% and 34.5% of the systems. This parallels the data that 24 out of 35 releases detected by leak detection methods were discovered by tank and piping tests.

In 95% of these cases, the most recent tank or piping test indicated that no leak was present even though the system eventually ended up on the leaking site list. Table 4 suggests that at least one reason for this poor performance is the infrequent nature of these tests. The average time elapsed between the last tank or piping test and the date of the release discovery is over 600 days, with only about 25% of the tests being performed within the previous year. Overall, the results suggest that leak detection methods fail most commonly because they are not used or are used infrequently. This does not prove that leak detection would work if widely practiced but does imply that greater implementation is required before its efficacy under field conditions can be established.

B. Data collected during inspections

The major advantage of the data collected during field inspections is the ability to compare design and operating practices for systems that have experienced a release to those that have not. It is important to note that the differentiation between these two categories was based on the best professional judgment of the inspector at the site during the inspection. No external corroborating evidence was sought or obtained. Although significant error may therefore exist in this classification, the comparison was believed to be instructive.

A total of 97 inspections were conducted at facilities deemed to have had "no release" and 138 were conducted at sites with evidence of a release. Tables 5-8 compare the distributions (as percentages) of tank characteristics, piping characteristics, and leak detection utilization between these two categories. In addition tables 5-7 further subdivide the systems with releases into those with the tank, piping or dispenser as a source. There is some overlap between these categories since 34% of sites with a reported release source listed more than one source.

Table 5 clearly reveals that tank releases are found overwhelmingly in old, single walled, bare steel tanks that have not been upgraded in any way. Similarly, piping that is double-walled and newer (<15 years old) is more likely to be found in the "no release"

[1] Farahnak and Drewry, January 1998

category (Table 6). Pressurized, single walled piping that does not include dispenser or turbine containment is more likely to be in the release category. For the sites in the release category (138), review of single walled site cases indicates that 91.7% included piping as one of the release sources and 80% had dispenser listed as one of the sources. For the double walled piping cases, 8.3% included piping as one of the release sources and 16.7% included dispenser area as one of the sources.

Leak detection usage does not differ greatly between the two groups, with the exception that methods associated with secondary containment (interstitial monitors and sumps) are more prevalent in the "no release" category and that mechanical line leak detectors are more prevalent in the release category (Table 7). These observations correspond to previous observations about the prevalence of secondary containment and pressurized piping in the two groups. The frequency of precision tests of tanks and piping also do not differ greatly between the two groups, with the average time since the last test being slightly longer for the "no release" group (Table 8). It is important to note that systems with no releases that are using another method of leak detection are not required to have a tank test on a regular basis; the time since test will be lengthened by inclusion of such systems in the calculated average.

Overall the comparison of characteristics between the "release" and "no release" categories reveals relatively minor differences in regulatory compliance with the notable exception of non-compliant tanks in the tank release category and higher proportions of double walled systems in the no release category. This suggests that preventing non-tank related releases is more difficult and may be primarily related to "unobservable" factors such as careful housekeeping or knowledgeable owner/operators rather than to particular technological features.

The site inspection database also includes more detailed information about the sources, causes and extent of releases than the LUSTIS database. This information is summarized for the 138 systems that were thought to have releases in Table 9. Tanks and piping remain the identified source of between 20-30% of the releases, consistent with findings shown in Figure 1 for the LUSTIS database. The improved detail of the inspection database allows dispenser leaks to be separated out as a source equal in magnitude to tanks or piping. Dispenser area releases were reported as a source for about 20% of the releases. The majority of release causes remain unknown even when the inspector is able to view the open excavation zone. Corrosion is the most commonly identified release cause consistent with the preponderance of bare steel systems in this database. Leak detection remains a fairly minor means of identifying releases, with less than 1% of releases discovered in this manner.

Inspectors were asked to estimate the extent of the release when possible, and were able to do so in about 70% of the cases. About a third (29.7%) of these releases appeared to extend beyond the excavation zone and about the same number being localized to various areas of the excavation zone. Less than 1% of the cases involved known off-site migration of product. However, since the inspectors did not typically have access to any off-site monitoring records, the study design is sure to underestimate the prevalence of such problems.

C. Analysis of double walled tanks and piping with reported releases

Double-walled tanks and piping are required for all new installations under California regulations. Some double-walled systems were identified as leaking in both the LUSTIS database review and the on-site data collection effort. Consequently, a more complete analysis of records in which both tanks and piping were double walled and releases were reported appears to be warranted. Tables 10 and 11 summarize a variety of characteristics of tanks and piping for the 66 LUSTIS sites and the 16 inspections in which releases were reported and both tanks and piping were double-walled. Clearly some of the follow-up information collected for the LUSTIS database are in error because 30 of the tanks are listed as either bare steel or clad, entries that do not make sense for a double-walled system. Consequently, the 66 sites is probably an overestimate of the extent of the problem. Only 22.7% of these systems included tanks that were fully upgraded by the addition of spill/overfill protection and striker plates. Further examination reveals that only 3% of these sites had both dispenser and turbine containment and that the piping was listed as the major source of releases for these systems. Only 1 system was identified in the database that met all required new tank standards.

Review of the inspection database discovered similar trends in the 16 "fully double-walled systems", although there were fewer questionable entries such as those found in the LUSTIS database (Table 11). In this case only two systems were identified that met all new tank standards including those for spill and overfill protection and dispenser and turbine containment. A striking feature of both the LUSTIS and site review information is the fact that about half of the double-walled systems reported the use of either interstitial monitors or sump leak detection systems, while all are required to have them according to current regulations. This observation may be due to inadequate documentation of the existence of such systems or may relate to a more fundamental compliance issue.

IV. FINDINGS

In this section the answers to the four questions posed at the outset of this report are reviewed.

1. *Releases are mainly associated with older, non-compliant systems.* Although a substantial number of motor fuel releases from UST systems continue to be reported to the SWRCB, very few of these releases are occurring from systems that meet all of the applicable regulatory standards. For example, in the inspection database only two cases of a fully upgraded system with a release were identified (out of 138 with releases). The major environmental threat from USTs continues to be posed by substandard tank systems that must be upgraded under current regulatory guidelines. A large fraction of the systems in the current inspection database is not in compliance with California UST regulations with respect to leak detection or system construction and these systems are disproportionately represented among the systems found to be leaking.

2. *Piping, particularly near the dispenser, remains the most problematic release source.* At present tank, piping and dispenser releases are of roughly equal frequency. However, virtually all of the tank releases are occurring from old, single walled, bare

steel tanks. With improved compliance and mandatory upgrades these releases should eventually be dramatically reduced. Piping and dispenser leaks occur with greater frequency from upgraded or double walled systems, suggesting that technology alone will not completely eliminate such releases.

3. *Releases are still mostly discovered during closure or removal operations.* Just 4.5% of the releases in the LUSTIS database and only 0.7% of those in the inspection database were discovered by leak detection activities. Routine release detection efforts are a critical element of the protection afforded by upgraded systems. If this portion of the regulations is not complied with, or the methods turn out to be incapable of detecting environmentally relevant leaks, environmental protection will be compromised.

4. *The study provides little information about release size at the time of discovery.* To answer the fourth question posed by the team will require additional investigation including soil and groundwater sampling around tanks with and without reported releases. The time allotted for the present study did not permit such data to be collected.

V. RECOMMENDATIONS

The following recommendations arise from the findings above:

1. *Improved inspection and enforcement practices.* Although some problems with upgraded systems are suggested by the results described above, it is important to remember that the vast majority of the releases were associated with UST systems that complied with few of the existing regulations. A high priority should be placed on examining current UST inspection and enforcement practices to ensure that substandard tanks are appropriately upgraded or closed. Currently, state law requires facility inspections to be conducted every three years. Therefore, a tank and piping test may be overdue more than three years (as noted in this study) before it is noted by the oversight agency. More frequent site inspections and file reviews may be one approach for improving compliance with leak detection requirements.

2. *Further investigation of double walled systems with releases.* A few cases (16) in the inspection database revealed double walled tank and piping systems that appeared to have had releases. Out of these 16 double walled sites, only 3 had dispenser pans and 9 had turbine containment. These cases and others like them deserve closer review of data to determine whether the releases were significant and what portions of the system failed.

3. *Develop outreach and education programs to improve leak detection utilization.* It is likely that leak detection utilization rates are low partly because of enforcement difficulties (see point 1 above) but also because tank owner/operators do not understand its importance or how to do it. A study of owner and operator attitudes and practices regarding leak detection might provide insight into how to design such an education and outreach campaign.

4. *Field-based research.* This research should quantify the probability and environmental significance of releases from UST systems meeting the 1998 standards. The research should strive to identify the source and cause of releases, and any deficiencies in leak detection systems. It should include single-walled, double-walled, and hybrid UST systems, and should avoid bias toward known leaking systems by including a statistically valid sample of all operating UST systems.

Table 1. Analysis of tank design for systems indicating the tank as the release source (LUSTIS data, total=155)			
Tank Material	Number	Percentage (all)	Percentage (excludes blanks)
blank	14	9.0	
bare steel	122	78.7	86.5
fiberglass	11	7.1	7.8
clad	6	3.9	4.3
lined & C.P.	1	0.6	0.7
Retrofit C.P.	1	0.6	0.7
Tank Walls			
blank	23	14.8	
single	121	78.1	91.7
double	11	7.1	8.3
Tank age			
>15	91	58.7	75.8
11-15	10	6.5	8.3
6-10	6	3.9	5.0
0-5	1	0.6	0.8
unknown	12	7.7	10.0
blank	35	22.6	
How Discovered			
Closure/removal	120	77.4	87.6
Leak Detection	7	4.5	5.1
Other	10	6.5	7.3
Blank	18	11.6	
Leak Detection Used			
Tank Test	67	43.2	72.8
Manual inventory	52	33.5	56.5
Statistical inventory	13	8.4	14.1
Automatic tank Gauge	13	8.4	14.1
Interstitial monitor	7	4.5	7.6
None (blank)	63	40.6	

Table 2. Analysis of piping design for systems indicating the piping as the release source (LUSTIS data, total=108)			
Piping Material	Number	Percentage (all)	Percentage (excludes blanks)
blank	16	14.8	
bare steel	56	51.9	60.9
fiberglass	26	24.1	28.3
clad	4	3.7	4.3
flexible	2	1.9	2.2
unknown	4	3.7	4.3
Piping Walls			
blank	15	13.9	
single	71	65.7	76.3
double	21	19.4	22.6
unknown	1	0.9	1.1
Piping age			
>15	44	40.7	54.3
11-15	23	21.3	28.4
6-10	5	4.6	6.2
0-5	2	1.9	2.5
unknown	7	6.5	8.6
blank	27	25.0	
Containment			
Blank	61	56.5	
None	37	34.3	78.7
Dispenser	6	5.6	12.8
Turbine	3	2.8	6.4
Dispenser/turbine	1	0.9	2.1
Pumping System			
Pressure	51	47.2	62.2
Conv. Suction	29	26.9	35.4
Safe Suction	2	1.9	2.4
Blank	26	24.1	
How Discovered			
Closure/removal	54	49.1	50.0
Leak Detection	10	6.5	6.6
Other	32	42.6	43.4
Blank	16	1.9	
Leak Detection Used			
Piping test	36	33.3	47.4
MLLD	28	25.9	36.8
ELLD	12	11.1	15.8
None (blank)	32	29.6	

Table 3. Leak detection method utilization (LUSTIS data, total=1072)			
Method	Number	Percentage	Leaks Discovered
Manual Inventory Control	422	39.4	1
Statistical Inventory Control	86	8.0	3
Tank test	533	49.7	17
Automatic Tank Gauge	112	10.4	1
Interstitial Monitor	81	7.6	1
Sump	8	0.7	0
Groundwater Monitor	4	0.4	4
Vapor Monitor	17	1.6	0
Piping test	370	34.5	7
Mechanical Line Leak Detector	237	22.1	1
Electronic Line Leak Detector	39	3.6	0
No dedicated tank method (INT,TT,GW,AGT,V,SIR)	436	40.7	
No dedicated piping method (PT, MLLD, ELLD)	609	56.8	

Table 4. Time elapsed between last test and release discovery (LUSTIS data)	
	Number or days
Tank test samples	533
incomplete information	76
Negative values	37
Average time elapsed	859.3 days
25th percentile	329 days
50th percentile	605 days
75th percentile	1192 days
Piping test samples	370
incomplete information	59
Negative values	26
Average time elapsed	623.6 days
25th percentile	245 days
50th percentile	444 days
75th percentile	870 days

Table 5. Comparison of tank characteristics for systems with and without suspected releases (Inspection database, total=235)			
	No Release (total =97)	Release (total=138)	Tank Source (total=36)
Tank Material			
blank	4.1	4.3	2.8
bare steel	59.8	67.4	94.4
fiberglass	18.6	22.5	2.8
clad	12.4	4.3	0.0
concrete	1.0	0.0	0.0
lined & C.P.	1.0	0.7	0.0
Mfr. C.P.	1.0	0.0	0.0
Plasteel	1.0	0.7	0.0
Other	1.0	0.0	0.0
Tank Walls			
blank	1.0	2.9	2.8
single	71.1	78.3	94.4
double	27.8	18.8	2.8
Tank age			
>15	41.2	58.0	86.1
11-15	27.8	15.2	5.6
6-10	17.5	10.1	0.0
0-5	4.1	4.3	0.0
unknown	0.0	3.6	2.8
blank	9.3	8.7	5.6
Upgrades			
none (blank)	67.0	71.0	91.7
spill	5.2	2.2	2.8
overfill	1.0	1.4	0.0
striker	0.0	2.2	2.8
spill/overfill	5.2	5.1	0.0
spill/striker	2.1	0.0	0.0
overfill/striker	0.0	2.2	0.0
Full upgrade	17.5	13.8	2.8

Table 6. Comparison of piping characteristics for systems with and without suspected releases (Inspection database, total=235)				
	No Release (total=97)	Release (total=138)	Piping source (total=24)	Dispenser source (total=30)
Piping Material				
blank	3.1	3.6	4.2	3.3
bare steel	63.9	60.9	50.0	53.3
fiberglass	28.9	31.9	41.7	40.0
clad	3.1	0.0	0.0	0.0
flexible	2.1	0.7	4.2	3.3
C.P.	1.0	0.7	0.0	0.0
Other	1.0	0.7	0.0	0.0
Piping Walls				
blank	8.2	5.1	0.0	3.3
single	64.9	79.0	91.7	80.0
double	26.8	15.9	8.3	16.7
Piping age				
>15	37.1	50.0	45.8	53.3
11-15	27.8	18.8	33.3	10.0
6-10	18.6	12.3	12.5	23.3
0-5	6.2	7.2	0.0	3.3
unknown	0.0	2.9	0.0	3.3
blank	10.3	8.7	8.3	6.7
Containment				
blank	21.6	10.1	0.0	6.7
dispenser	10.3	3.6	0.0	0.0
turbine	9.3	9.4	16.7	6.7
dispenser&turbine	6.2	6.5	8.3	6.7
None	51.5	68.1	75.0	73.3
unknown	1.0	2.2	0.0	6.7
Pump system				
pressure	34.0	60.1	91.7	66.7
conv. Suction	40.2	20.3	4.2	16.7
safe suction	8.2	3.6	0.0	0.0
gravity	2.1	5.1	0.0	0.0
none	1.0	0.0	0.0	0.0
blank	13.4	10.9	4.2	13.3

Table 7. Comparison of leak detection methods employed for systems with and without suspected releases (Inspection database, total=235)					
	No Release (total=97)	Release (total=138)	Tank Source (total=36)	Piping Source (total=24)	Dispenser Source (total=30)
Manual Inventory	29.9	30.4	44.4	29.2	40.0
Statistical Inventory	2.1	11.6	16.7	33.3	3.3
Tank test	25.8	29.0	27.8	50.0	40.0
Automatic Tank Gauge	13.4	10.9	2.8	25.0	6.7
Interstitial monitor	20.6	8.7	2.8	8.3	13.3
Sump	9.3	1.4	0.0	0.0	0.0
Groundwater monitor	1.0	0.0	0.0	0.0	0.0
Vapor monitor	4.1	4.3	0.0	4.2	13.3
Piping test	10.3	14.5	13.9	12.5	26.7
MLLD	9.3	23.9	19.4	41.7	36.7
ELLD	5.2	5.1	2.8	4.2	6.7
No leak detection	22.7	27.5	33.3	8.3	10.0
No dedicated tank LD	44.3	51.4	63.9	25.0	26.7
No dedicated piping LD	76.3	65.2	66.7	50.0	53.3

Note: Totals do not add to 100% since multiple release detection methods were indicated for some systems inspected.

Table 8. Comparison of tank and piping test results and frequency for systems with and without suspected releases (Inspection database, total=235)		
	No Release (total=97)	Release (total=138)
Last Tank Test Result		
blank	41.2	35.5
fail	2.1	0.0
pass	56.7	64.5
time since test (days)		
average	1157.6	1018.0
25th percentile	399.5	375
50th percentile	732	547
75th percentile	1793	1364
Last Piping Test Result		
blank	55.7	44.9
fail	0.0	0.7
pass	44.3	54.3
time since test (days)		
average	952.6	689.1
25th percentile	238.3	340.8
50th percentile	648	518
75th percentile	1075.5	858

Table 9. Leak source and method of identification for systems with releases (Inspection database, total=138)			
Source	Number	Percentage (all)	Percentage (excludes blanks)
blank	28	20.3	
unknown	25	18.1	22.7
tank	19	13.8	17.3
piping	11	8.0	10.0
dispenser	19	13.8	17.3
overfill	6	4.3	5.5
spill	1	0.7	0.9
piping/dispenser	5	3.6	4.5
piping/tank	6	4.3	5.5
dispenser/tank	4	2.9	3.6
overfill/tank	2	1.4	1.8
overfill/tank/piping	2	1.4	1.8
other combinations	10	7.2	9.1
Cause			
blank	38	27.5	
unknown	47	34.1	47.0
corrosion	16	11.6	16.0
overfill	13	9.4	13.0
loose fitting	12	8.7	12.0
physical damage	4	2.9	4.0
spill	2	1.4	2.0
poor installation	2	1.4	2.0
structural failure	2	1.4	2.0
construction	1	0.7	1.0
corrosion/overfill	1	0.7	1.0
Identification			
leak detection	1	0.7	0.7
closure/removal	87	63.0	63.0
other	2	1.4	1.4
unknown	48	34.8	34.8
Extent			
large (beyond excavation)	41	29.7	43.2
localized tank	27	19.6	28.4
localized piping	3	2.2	3.2
localized dispenser	18	13.0	18.9
tank/pipe	2	1.4	2.1
pipe/dispenser	1	0.7	1.1
dispenser/tank	1	0.7	1.1
dispenser/tank/piping	1	0.7	1.1
off-site	1	0.7	1.1
blank	43	31.2	

Table 10. LUSTIS database: review of records with double walled tanks and piping (Total=66)			
Release Cause	Number	Percentage (all)	Percentage (excludes blanks)
blank	22	33.3	
unknown	31	47.0	70.5
corrosion	3	4.5	6.8
structural failure	1	1.5	2.3
other	7	10.6	15.9
tank	2	3.0	4.5
Tank upgrade			
blank	27	40.9	
overfill	3	4.5	7.7
spill	4	6.1	10.3
spill/overfill	14	21.2	35.9
spill/striker	1	1.5	2.6
striker	1	1.5	2.6
complete	15	22.7	38.5
none	1	1.5	2.6
Tank material			
bare steel	12	18.2	18.2
steel w/ lining	1	1.5	1.5
bare steel/plasteel	1	1.5	1.5
clad	18	27.3	27.3
fiberglass	33	50.0	50.0
Tank age			
blank	7	10.6	
unknown	3	4.5	5.1
0-5 yrs	7	10.6	11.9
6-10 yrs	23	34.8	39.0
11-15 yrs	20	30.3	33.9
>15 yrs	6	9.1	10.2
Pipe materials			
blank	3	4.5	
fiberglass	47	71.2	74.6
bare steel	9	13.6	14.3
steel/fiberglass	1	1.5	1.6
PVC	2	3.0	3.2
MeOH compatible	1	1.5	1.6
flexible	2	3.0	3.2
C.P.	1	1.5	1.6
Pipe containment			
blank	35	53.0	
unknown	1	1.5	3.2
none	12	18.2	38.7
dispenser	6	9.1	19.4
turbine	10	15.2	32.3
dispenser/turbine	2	3.0	6.5

Pipe pumping			
blank	7		
pressure	47	71.2	79.7
conv. Suction	9	13.6	15.3
safe suction	1	1.5	1.7
gravity	2	3.0	3.4
LD/Int			
yes	38	57.6	57.6
no	28	42.4	42.4
LD/Sump			
yes	3	4.5	4.5
no	63	95.5	95.5
Release Source			
blank	20	30.3	
piping	17	25.8	37.0
tank	7	10.6	15.2
unknown	17	25.8	37.0
other	5	7.6	10.9
How discovered			
blank	18	27.3	
other	24	36.4	50.0
tank closure	20	30.3	41.7
inventory control	1	1.5	2.1
subsurface monitor	3	4.5	6.3
Estimated release age			
blank	22	33.3	
<1 yr	3	4.5	6.8
>1 yr.	5	7.6	11.4
unknown	36	54.5	81.8
Estimated release size			
blank	29	43.9	
beyond excavation	8	12.1	21.6
localized dispenser	5	7.6	13.5
localized piping	7	10.6	18.9
localized tank	8	12.1	21.6
localized tank, piping	1	1.5	2.7
localized piping, dispenser	1	1.5	2.7
tank, piping, dispenser	1	1.5	2.7
off-site	2	3.0	5.4
unknown	4	6.1	10.8
Piping age			
blank	16	24.2	
0-5 yrs	6	9.1	12.0
6-10 yrs	17	25.8	34.0
11-15 yrs	20	30.3	40.0
>15 yrs	3	4.5	6.0
unknown	4	6.1	8.0

Table 11. Inspection database: review of records (release cases) with double walled tanks and piping (Total=16)		
Release Cause	Number	Percentage
blank	8	50
unknown	6	37.5
loose fitting	1	6.25
structural failure	1	6.25
Tank upgrade		
blank	6	37.5
overfill	1	6.25
spill/overfill	1	6.25
complete	8	50
Tank material		
blank	2	12.5
clad	2	12.5
fiberglass	12	75
Tank age		
blank	3	18.75
0-5 yrs	5	31.25
6-10 yrs	7	43.75
11-15 yrs	1	6.25
>15 yrs	0	0
Pipe material		
fiberglass	16	100
Pipe containment		
blank	2	12.5
none	4	25
dispenser	1	6.25
turbine	7	43.75
dispenser/turbine	2	12.5
Pipe pumping		
pressure	14	87.5
conv. Suction	1	6.25
safe suction	0	0
gravity	1	6.25
Interstitial LD		
yes	6	37.5
no	10	62.5
Sump LD		
yes	1	6.25
no	15	93.75
Release Source		
blank	8	50
dispenser	3	18.75
piping/dispenser	1	6.25
spill	1	6.25
unknown	3	18.75

APPENDIX A-1

UST Survey Form for Data Review
California State Water Resources Control Board

UST Survey Form for Data Review
California State Water Resources Control Board

Agency Information

Reviewer: ____________ Agency: ____________ Date: ____________

Site Information

Site name : ____________

Address ____________ ____________ ____________
Street Address City County

Facility type ☐ Retail Gasoline Outlet ☐ Other ____________

System Information

Tank :

Material: ☐ Bare Steel ☐ Mfr. C.P. ☐ Retrofit C.P. ☐ Lined + C.P. ☐ Clad ☐ Fiberglass ☐ Other

Walls: ☐ Single wall ☐ Double wall

Product: ☐ Gasoline ☐ Diesel

Age: ☐ < 5 yrs ☐ 5-10yr ☐ 11-15yr ☐ >15yr

Upgrade: ☐ Spill ☐ Overfill ☐ Striker Plate

Piping:

Material: ☐ Bare steel ☐ C.P. ☐ Rigid fiberglass ☐ Flexible

Walls: ☐ Single ☐ Double

Age: ☐ <5yr ☐ 5-10yr ☐ 11-15yr ☐ >15yr

Containment: ☐ Dispenser ☐ Turbine ☐ None

Pumping: ☐ Pressure ☐ Conventional Suction ☐ Safe suction ☐ Gravity

Leak Detection

Method(s) used at time release identified, or at closure if no release:

☐ MIR ☐ Sump dispenser containment LD ☐ SIR (Brand/Model ____________)

☐ TT (Brand/Model ____________) ☐ PT (Brand/Model ____________)

☐ INT (Brand/Model ____________) ☐ ATG (Brand/Model ____________)

☐ GW (Brand/Model ____________) ☐ Vadose (Brand/Model ____________)

☐ Mech. LLD (Brand/Model ____________) ☐ Elect. LLD (Brand/Model ____________)

Last TT? ☐ Pass ☐ Fail ☐ Inconclusive Date ____________

Last PT? ☐ Pass ☐ Fail ☐ Inconclusive Date ____________

Last SIR? ☐ Pass ☐ Fail ☐ Inconclusive Date ____________

Release Information

Date of confirmed release ____________

Cause: ☐ Physical damage ☐ Corrosion ☐ Mechanical failure ☐ Loose Fitting ☐ Overfill

☐ Faulty installation ☐ Structural Failure ☐ Spill ☐ Unknown ☐ Other ____________

Source: ☐ Tank ☐ Piping ☐ Dispenser ☐ Spill ☐ Overfill ☐ Unknown ☐ Other ____________

How identified? ☐ LD method(s) specify ____________ ☐ Closure/Removal ☐ Other ____________

Estimated age release: ☐ Recent (< 1yr) ☐ Old (>1yr) ☐ Unknown

Estimated extent ☐ Localized tank ☐ Localized piping ☐ Localized Dispenser ☐ Large (beyond excavated area) ☐ Off-site

Product release: ☐ Gasoline ☐ Diesel

Instructions

Please exercise your best professional judgment when reviewing the files and completing the survey form.

System Information
Material: Please note the material the tank is made of.
Walls: Please note whether the tank is single or double walled.
Product: Please note the contents of the tank at the time of your inspection.
Age: Please provide the age of the tank system. If the site has multiple tanks of different ages, please note that. If this is the case, and there is a release, please note which tank had the release.
Upgrade: Please note whether the tank(s) have spill and overfill devices in place.
Piping: Please note the material of the pipes carrying product.
Walls: Please note whether the pipes are single or double walled.
Age: Please provide the age of the tank system. If the site has piping of different ages, please note that. If this is the case, and there is a release, please note which piping had the release.
Containment: This section refers to the presence or absence of containment sumps under the dispenser or over the tank. Please check the appropriate box if a sump is present.
Pumping: Please note the type of pumping system.

Leak Detection

To the best of your knowledge, please note the type of leak detection equipment at the site, and whether it was operational at the time of the inspection.
Last Tank Tightness Test (TT): Please note the result of the last tank tightness test.
Last Piping Tightness Test (PT): Please note the results of the last piping tightness test.
Last Statistical Inventory Reconciliation (SIR): If SIR was used at the site, please note the results of the last SIR test.

Release Information
Confirmed release date: If the release is discovered at the time of the inspection, please use the date of the inspection. If you have more definite information regarding the release date, please use that date.
Cause/Source: Based upon your best judgment please note the cause and source of the release. For purposes of this survey, please consider a tank leak as any breach in the tank and not directly a part of any piping connection; a piping leak to be any release from any portion of the piping (except as defined as a dispenser leak) up to and including connections to the tank; dispenser leaks are any releases from those portions of the piping which, if the piping is double walled, would be on the dispenser side of the terminus of the double walled condition, or if single walled, those portions of the piping which are exposed above grade under a dispenser.
How identified: Specify how you identified the presence of a release.
Estimated Age: Please estimate the age of the release. If there is evidence of multiple releases, please note that and estimate the age of all releases.
Estimated Extent: Please note the estimated extent of the release, based upon any and all information available to you at the time of the inspection and your best professional judgment.
Product Released: Please note the type of product released. If multiple releases are present, please note all products released.

Key to abbreviations

C.P.	Cathodic Protection	INT	Interstitial Monitor
LD	Leak Detection	TT	Tank Tightness Test (precision test)
MIR	Manual Inventory Reconciliation	PT	Piping Test (hydrostatic)
SIR	Statistical Inventory Reconciliation	ATG	Automatic Tank Gauging System
GW	Groundwater Monitoring System	Vadose	Vadose Zone Monitoring System
Mech. LLD	Mechanical Line Leak Detector	Elect. LLD	Electronic Line Leak Detector

Comments

APPENDIX A-2

Current UST Site Survey Form
California State Water Resources Control Board

Current UST Site Survey Form
California State Water Resources Control Board

Agency Information Reviewer: ____________ Agency: ____________ Date: ________

Reason for inspection ☐Removal ☐Repair ☐Release Investigation ☐Compliance Inspection ☐Other ____________

Site Information Site name: ____________

Address: ____________ Street Address ____________ City ____________ County

Facility type: ☐Retail Gasoline Outlet ☐Other ____________

System Information

Tank:
- Material: ☐Bare Steel ☐Mfr. C.P. ☐Retrofit C.P. ☐Lined + C.P. ☐Clad ☐Fiberglass ☐Other
- Walls: ☐Single Wall ☐Double Wall
- Product: ☐Gasoline ☐Diesel
- Age: ☐<5yr ☐5-10yr ☐11-15yr ☐>15yr
- Upgrade: ☐Spill ☐Overfill ☐ Striker Plate

Piping:
- Material: ☐Bare steel ☐C.P. ☐Rigid Fiberglass ☐Flexible
- Walls: ☐Single ☐Double
- Product: ☐Gasoline ☐Diesel
- Age: ☐<5 yr ☐5-10 yr ☐11-15 yr ☐>15 yr
- Containment: ☐Dispenser ☐Turbine ☐None
- Pumping: ☐Pressure ☐Conventional Suction ☐Safe suction ☐Gravity

Leak Detection
Method(s) used at time release identified, or at closure if no release:

☐MIR ☐ Sump dispenser containment LD ☐SIR (Brand/Model____________)

☐TT (Brand/Model____________) ☐PT (Brand/Model____________)

☐INT (Brand/Model____________) ☐ATG (Brand/Model____________)

☐GW (Brand/Model____________) ☐Vadose (Brand/Model____________)

☐Mech. LLD (Brand/Model____________) ☐Elect. LLD (Brand/Model____________)

Last TT? ☐Pass ☐Fail ☐Inconclusive Date: ____________

Last PT? ☐Pass ☐Fail ☐Inconclusive Date: ____________

Last SIR? ☐Pass ☐Fail ☐Inconclusive Date : ____________

Release Information

☐No Release Suspected (skip remainder of section) Date of Confirmed Release: ____________

Cause: ☐Physical Damage ☐Corrosion ☐Mechanical Failure ☐ Loose Fitting ☐Overfill ☐Faulty Installation ☐Structural Failure ☐Spill ☐Unknown ☐Other ____________

Source: ☐Tank ☐Piping ☐Dispenser ☐Spill ☐Overfill ☐Unknown ☐Other ____________

How identified? ☐LD method(s) Specify: ____________ ☐Closure/Removal ☐Other ____________

Estimated age of release: ☐Recent (< 1yr) ☐Old (>1yr) ☐Unknown

Estimated extent ☐Localized Tank ☐Localized Piping ☐Localized Dispenser ☐Large (beyond excavated area) ☐Off-site

Product released ☐Gasoline ☐Diesel ☐MTBE detected ☐Highest Level

Instructions

This form should be completed only when USTs which contain gasoline or diesel fuel. The survey should be filled out even if there is no evidence of a leak. Please exercise your best professional judgment when evaluating the tank systems, their components and any possible release.

System Information

Material: Please note the material the tank is made of.
Walls: Please note whether the tank is single or double walled.
Product: Please note the contents of the tank at the time of your inspection.
Age: Please provide the age of the tank system. If the site has multiple tanks of different ages, please note that. If this is the case, and there is a release, please note which tank had the release.
Upgrade: Please note whether the tank(s) being inspected have spill and overfill devices in place.
Piping: Please note the piping material of the pipes carrying product.
Walls: Please note whether the pipes are single or double walled.
Age: Please provide the age of the tank system. If the site has piping of different ages, please note that. If this is the case, and there is a release, please note which piping had the release.
Containment: This section refers to the presence or absence of containment sumps under the dispenser or over the tank. Please check the appropriate box if a sump is present.
Pumping: Please note the type of pumping system.

Leak Detection

To the best of your knowledge, please note the type of leak detection equipment at the site, and whether it was operational at the time of the inspection.
Last Tank Tightness Test (TT): Please note the result of the last tank tightness test.
Last Piping Tightness Test (PT): Please note the results of the last piping tightness test.
Last Statistical Inventory Reconciliation (SIR): If SIR was used at the site, please note the results of the last SIR test.

Release Information

Confirmed release date: If the release is discovered at the time of the inspection, please use the date of the inspection. If you have more definite information regarding the release date, please use that date.
Cause/Source: Based upon your best judgment please note the cause and source of the release. For purposes of this survey, please consider a tank leak as any breach in the tank and not directly a part of any piping connection; a piping leak to be any release from any portion of the piping (except as defined as a dispenser leak) up to and including connections to the tank; dispenser leaks are any releases from those portions of the piping which, if the piping is double walled, would be on the dispenser side of the terminus of the double walled condition, or if single walled, those portions of the piping which are exposed above grade under a dispenser.
How identified: Specify how you identified the presence of a release.
Estimated Age: Please estimate the age of the release. If there is evidence of multiple releases, please note that and estimate the age of all releases.
Estimated Extent: Please note the estimated extent of the release, based upon any and all information available to you at the time of the inspection and your best professional judgment.
Product Released: Please note the type of product released. If multiple releases are present, please note all products released.

Key to Abbreviations

C.P.	Cathodic Protection	INT	Interstitial Monitor
LD	Leak Detection	TT	Tank Tightness Test (precision test)
MIR	Manual Inventory Reconciliation	PT	Piping Test (hydrostatic)
SIR	Statistical Inventory Reconciliation	ATG	Automatic Tank Gauging System
GW	Groundwater Monitoring System	Vadose	Vadose Zone Monitoring System
Mech. LLD	Mechanical Line Leak Detector	Elect. LLD	Electronic Line Leak Detector

Comments

REPORT OF THE STATE WATER RESOURCES CONTROL BOARD'S ADVISORY PANEL ON THE LEAK HISTORY OF NEW AND UPGRADED UST SYSTEMS

January 1999

Allan Patton, SWRCB, Advisory Panel Chairperson
Shahla Farahnak, P.E., SWRCB, Project Manager and UST Workgroup Chairperson
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David Arrieta, DNA Associates
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Marilyn Sarrantis, California Independent Oil Markets Association
Jim Smith, San Bernadino County Environmental Health Serv.
Chris Steck, Mountain View Fire Department
Cris Tulloch, Santa Clara Valley Water District
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Paul Westbrook, Ph.D., Shell Oil Company
John White, City of Anaheim Fire Department
Chris Winsor, ARCO Products Co.
Tom Young, UC Davis, Department of Civil Engineering
Dave Zedrick, Environmental Resources Council

Introduction

In October 1997, in response to increasing reports of MTBE releases from underground storage tanks (UST), Governor Wilson issued a signing message for SB 521, SB 1189, and AB 592 requesting that further actions be taken to ensure that oxygenates [such as methyl tertiary butyl ether (MTBE)] do not find their way from leaking UST systems into the environment. The State Water Resources Control Board (SWRCB) was asked to convene an advisory panel of knowledgeable people to:

> Review existing databases of UST contamination sites to determine if there is a leak history associated with UST systems meeting the 1998 federal and state standards; and if so, identifying appropriate measures that would assure the prevention and detection of oxygenate releases from retail marketing facilities.

This report presents the findings and recommendations of the panel.[1]

Background

Program History

Prior to 1984, California did not have a uniform regulatory program for USTs. Commonly, UST systems installed before that year consisted of single-walled bare-steel tanks and piping which were subject to corrosion and undetected leaks. Under a statewide regulatory program that became effective January 1, 1984, all new UST systems were required to meet standards for corrosion protection, leak detection, and spill and overfill prevention. In addition, new systems were required to include secondary containment which was capable of holding any leak from the primary containment until the leak could be detected and cleaned up. In 1990, to be consistent with federal rules, a requirement was added to the California program to upgrade all older systems to meet minimum standards to protect against corrosion, prevent spills and overfills and to address other deficiencies in the older systems. The deadline for meeting the upgrade requirements was set for December 22, 1998, the same as in the federal program.

Characteristics of Post-1998 UST Systems

The post-1998 UST population will include both new and upgraded systems. All post-1998 systems will include corrosion protection, spill and overfill protection devices, and some form of leak detection. Systems can be grouped as follows:

---

[1] Governor Wilson also asked that the panel evaluate refueling facilities and practices at marinas located on surface water bodies serving as drinking water sources, and determine if any further upgrades should be made to eliminate releases to the water bodies. That effort is covered in a separate report.

1. Secondarily-contained systems - These systems consist of double-walled tanks and piping with continuous interstitial leak detection and under-dispenser and pump turbine containment sumps which are continuously monitored. If installed and maintained properly, these systems provide the maximum protection against releases. (Some secondarily-contained systems were installed without under-dispenser containment and, in some cases, pump turbine containment sumps. If installed after July 1, 1987, these features must be present for the UST to be in full compliance.)

2. Hybrid systems - Prior to July 1, 1987, some motor vehicle fuel UST systems were installed with a double-walled tank and single-walled piping. The piping is monitored by an automatic leak detector capable of shutting off the pump when a leak rate above 3 gallons per hour (gph) occurs. Annual pressure testing capable of detecting a leak rate of 0.1 gph is also performed.

3. Single-walled systems - These systems were installed prior to January 1, 1984, and consist of single-walled fiberglass or corrosion-protected and lined steel tanks monitored with monthly leak detection at a 0.2 gph rate and single-walled piping (corrosion protected steel or fiberglass) equipped as above.

The number of systems fitting each of the above groups that will be in operation after the deadline is unknown. Many of the non-upgraded, pre-1984 tanks will be operated up to the deadline and then closed, so it is unknown at this time how many single-walled UST systems will remain. It is expected, however, that most tank systems will be double-walled. The major exception will be single-walled fiberglass tanks, which were not generally affected by the upgrade program because of their intrinsic corrosion protection. The SWRCB will work with local UST agencies to develop data on the post-1998 UST population.

Panel workplan

The panel divided into three teams to accomplish the following tasks:

Task 1: Evaluate the compatibility and permeability of UST systems for MTBE and other oxygenates. The activities of this team included a literature review, review of industry standards, and a survey of UST system manufacturers.

Task 2: Follow-up on reports of releases from upgraded facilities to determine if the release was in fact from the upgraded system, and, if so, to identify the probable source and causes of the release. Cases were selected from local agency referrals.

Task 3: Compile and evaluate data on a large number of UST release cases and develop statistics on the types of UST systems that have experienced releases, the sources and causes of those releases, and whether leak detection was instrumental in finding the releases. This task was accomplished by having local agency inspectors throughout the state complete survey forms developed by the panel.

Each team has prepared a detailed report which is available from the SWRCB (800-999-8844) or on the UST program web site (www.swrcb.ca.gov -- click on "underground storage tanks.") The findings and recommendations of the three teams have been combined into this report.

Panel Findings

1. There is evidence of releases from new and upgraded UST systems. However, it could not be determined based on available data whether there is a statistically significant leak history associated with properly-installed, operated, and maintained UST systems meeting the 1998 standards. Most available data evaluated in this study are skewed toward facilities with known releases, older systems, and/or systems with non-upgraded components.

2. Releases found at UST sites meeting the 1998 standards generally appeared to be the result of improper installation, operation, or maintenance. The relative extent to which these systems occur in the overall UST population is unknown.

3. Additional research is needed to quantify the leak history for the post-1998 UST population before it can be determined what, if any, changes to the current design, construction and monitoring standards are needed to assure the prevention and detection of oxygenate releases at UST facilities.

4. Immediate improvements are warranted in areas such as owner/operator, contractor, and inspector training; regulatory agency inspection and enforcement procedures; operator compliance with leak detection and response requirements; and facility management practices.

5. Due to its water solubility and environmental persistence, some occurrences of MTBE in groundwater at petroleum dispensing facilities may result from small spills during tank filling, dispensing and maintenance operations, rather than leaks from UST system components. Other constituents of gasoline may not be detected because of volatilization, adsorption to soil particles, or biodegradation.

6. Existing information indicates that MTBE and other ethers blended with gasoline are generally compatible with UST system components in liquid phase, and that releases should not occur due to the deterioration of system components from contact with these ethers. However, some polymeric materials may be subject to swelling and softening when in contact with alcohols, either neat or blended with gasoline, or neat MTBE. Alcohols and alcohol/gasoline blends should not pose compatibility problems if existing industry recommendations for component materials are followed.

7. It is commonly held that, because of the larger molecular size of MTBE relative to methanol, any material which is compatible with methanol will not allow

permeation of MTBE. However, this is not a rigorous theory, and is not a substitute for direct measurement.

8. There is insufficient information available to determine whether there are UST system material compatibility or permeability problems associated with vapor phase MTBE.

9. Current UST product component testing for compatibility and permeability does not include consistent performance criteria for safe operation and environmental protection. Results of testing conducted by third parties are generally treated as proprietary by the UST equipment industry. The federal and California UST regulations do not require UST equipment manufacturers to report third-party testing results for performance of tanks, piping, or other UST system components, as is required for leak detection equipment.

10. There is evidence that leak detection programs may not be performing as intended. This finding is based on the fact that less than 4 percent of releases reported during a 24-month period beginning June 1, 1996, were discovered by a leak detection program. It appears that in many instances tank owners are simply not conducting the leak detection tests required or are performing these tests infrequently.

11. There is no standard procedure to test the integrity of secondary containment and no regulatory requirement to do so except at the time of initial installation. Consequently, it cannot be determined if secondary containment is able to perform its function of containing a release from the primary containment until it can be detected and cleaned up. This is especially important for systems with non-integral secondary containment because water intrusion into the interstice casts doubt as to the integrity of the secondary containment.

12. Several common critical components in UST systems were found to be the source of a disproportionate number of releases. These include under dispenser piping, pipe fittings, and turbine sumps.

13. Based on available data, the age of a UST system appears to be a significant factor in increasing the potential for a release. This may be due to increased likelihood of component corrosion or deterioration and use of outdated technology.

14. There appears to be a lack of adequate enforcement against owners/operators who are not complying with leak detection requirements or who fail to follow-up on suspected releases.

Panel Recommendations

The panel was able to reach general consensus on the recommendations listed below. As can be expected from a panel of diverse interests, these recommendations often represent a compromise, and may not be the preferred option of any particular organization, group, or individual participating on the panel. Footnotes are included where appropriate to address varying points of view on specific recommendations.

The subject of greatest debate was whether all remaining single-walled UST systems should be phased out based on an age or environmental sensitivity criterion. Many panel members supported this approach because of the apparent poor performance of leak detection systems, the relatively high leak rate threshold of monitoring equipment, the inability of single-walled systems to contain a release, evidence of poor installation workmanship on piping systems, the significance of age as a factor in determining likelihood of a release, and finally, the concerns about the impacts of MTBE on water resources.[2]

Some panel members were opposed to the phase-out approach, because we are just completing a ten-year upgrade/replacement program and the available information is inconclusive with respect to the post-1998 population. They felt more evidence is needed before recommending a new "upgrade" program. These members were concerned about any additional costs to the business if new capital improvements were required in the short term because there has not been enough time to amortize major costs recently incurred for upgrades. They felt that if further research shows that remaining non-secondarily contained UST systems should be replaced, the phase-out period should be long enough to reasonably allow past capital costs to be amortized, or financial assistance should be provided. On balance, the panel decided not to recommend immediate phase-out of remaining single-walled components until further research is completed.

1. Field-based research should be conducted to quantify the probability and environmental significance of releases from UST systems meeting the 1998 standards. The research should strive to identify the source and cause of releases, and any deficiencies in leak detection systems. It should include single-walled, double-walled, and hybrid UST systems, and should avoid bias toward known leaking systems by including a statistically valid sample of all operating UST systems. This work should also address the question of whether some MTBE occurrences in groundwater at retail petroleum facilities are the result of minor surface spills or other non-UST related activities. The research should be overseen by the SWRCB, and should be cooperatively funded by government and industry. Work should include peer review and should be completed within two years. The results of this research, combined with further in-depth analysis of the data collected by the panel, should be used by government and industry to develop appropriate

[2] Some panel members believe that a phase-out of MTBE could help to reduce the need for any future changes in UST standards.

changes in design, construction, monitoring, operation, or maintenance requirements for current and future UST systems.

2. Industry, in consultation with state and local government agencies, should establish UST installer, owner/operator, service technician and inspector training programs and best management practices for UST facilities. Training should emphasize operation of leak detection systems and response procedures to suspected releases.

3. The SWRCB should require by regulation that UST facility owner/operators, service technicians, installers, and inspectors meet minimum industry-established training standards and that facilities be operated in a manner consistent with industry-established best management practices. The SWRCB should implement an outreach campaign to educate small business owners/operators on the importance of this requirement.

4. The Contractor's State License Board (CSLB) should, in consultation with the SWRCB, industry and local government, review its requirements for UST system installation and removal contractors and make changes where appropriate to ensure contractors are properly qualified. The CSLB changes should require all contractors to complete industry-established UST system installation/removal training, with periodic refresher training as appropriate.

5. The SWRCB should adopt regulations to reduce fraud and false reporting by owners and operators and UST system inspection, testing, and service/repair companies and to establish effective enforcement procedures in cases involving fraud.

6. New fuel additives that may have a significant potential for environmental risk should be properly tested for UST system compatibility before they are introduced into the retail market.

7. Standards should be developed through a cooperative effort between government, the petroleum equipment industry, and nationally-recognized independent testing organizations to establish uniform criteria for material compatibility and permeability testing for conventional and oxygenated fuels. The standards should address environmental protection as well as safety concerns. Existing compatibility standards could be consolidated and expanded to include consistent criteria for swelling, physical property retention, and other compatibility measures. New standards and criteria for permeability would need to be developed. Results of material compatibility and permeability testing with conventional and oxygenated fuels should be made readily available to any interested party.

8. The SWRCB should, in consultation with industry and local government, adopt regulations to require that secondary containment components of all new UST systems, including under-dispenser and pump turbine containment, be tested

periodically to ensure they are capable of containing releases from the primary containment until the releases can be detected and cleaned up.[3]

9. The SWRCB should develop guidance immediately, in consultation with local agencies and industry, for local UST regulatory agencies regarding proper installation and inspection procedures for identified critical components.

10. The SWRCB should issue guidance immediately to local UST regulatory agencies clarifying that under existing statutes, all piping systems attached to a UST installed after July 1, 1987, must be fitted with under-dispenser containment, and that any deficient systems must be retrofitted as soon as possible, but not later than two years from date of this report.[4]

11. The SWRCB should review existing enforcement authority and procedures to determine if changes are needed to enable local agencies to take adequate enforcement action against owners and operators of non-compliant facilities.

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[3] There was concern by some panel members that routine testing of secondary containment may be impractical for some components. One panel member suggested that testing requirements for secondary containment should be based on the relative risk posed by the individual equipment and take into account actual leak histories for each component.

[4] This was a major subject of discussion. Some panel members believed that dispenser pans should be required immediately at all UST facilities and others believed that the requirement should not be mandatory where the system was approved without pans at the time of installation. Other members believed that they should only be required at the time of major re-piping work or on the basis of site-specific environmental risk. On December 2, 1998, the Division of Clean Water Programs issued a letter addressing this subject.

STATE WATER RESOURCES CONTROL BOARD'S ADVISORY PANEL ON THE LEAK HISTORY OF NEW AND UPGRADED UST SYSTEMS

OXYGENATE COMPATIBILITY AND PERMEABILITY REPORT
(UST Team 1 Report)

JANUARY 1999

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I. EXECUTIVE SUMMARY

Team 1 addressed whether oxygenated fuels are incompatible with or able to permeate through materials used in underground storage tank (UST) systems. The fuel oxygenates of concern included two alcohols–methanol (MeOH) and ethanol (EtOH)–and four ethers–methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and diisopropyl (DIPE). Metallic and non-metallic materials used in the underground and aboveground components of a UST system–including not only the tank, piping, turbine sump, and fittings, but also the dispenser pan and hoses and vapor recovery equipment–were considered. Team 1 collected its information and data through an extensive literature review and a survey of the petroleum equipment industry.

Existing information indicates that MTBE and other ethers blended with gasoline are generally compatible with UST system components in liquid phase, and that releases should not occur due to the deterioration of system components from contact with the ether. However, some polymeric materials may be subject to swelling and softening when in contact with alcohols–either neat or blended with gasoline–or neat MTBE. Alcohols can pose compatibility problems for metals and non-metals, but industry recommendations have been made on appropriate materials for storing alcohol and alcohol-gasoline blends which should be followed and monitored. A single, comprehensive industry standard for compatibility testing of nonmetallic materials in UST systems does not exist, nor do the current standards ensure environmental protection. The federal and California UST regulations do not require UST equipment manufacturers to report third-party testing results for performance of tanks, piping, or other UST system components, as is required for leak detection equipment. Furthermore, results of third-party testing are generally treated as proprietary by the UST equipment industry.

The permeation rate of oxygenated gasoline is greater than nonoxygenated gasoline in common hose materials. In general, alcohol-blended fuels are more permeable than ether blends, with methanol being most aggressive. For both ethers and alcohols, greater permeability in gasoline blends is observed in elastomers (e.g., hoses, seals, gaskets, packing) than in thermoplastics (e.g., flexible piping, sumps, vapor recovery tubing). First, questions about permeation of oxygenated fuels through UST system equipment cannot be answered until a standard protocol is developed. The objective would be to directly measure the mass flow of ethers or alcohols, dissolved in gasoline, through materials of interest using techniques and instrumentation capable of quantifying individual chemical species. Second, using such a protocol, permeability data should be collected for non-metallic materials used in UST systems, especially composite materials used for rigid piping and tanks. Once these are accomplished, an estimate can be made for oxygenate permeation to air and soil from a UST system at a retail gas station. Any estimated volume of oxygenates due to permeation over time should be compared to the quantity of oxygenates released during small spills that frequently occur at retail gas stations and other dispensing facilities. An environmentally-based standard for permeability testing may need to be established, as the only permeation standard applicable to UST systems is intended to ensure safe operation of the equipment, not necessarily environmental protection.

II. BACKGROUND

A. Problem Statement

The task of Team 1 was to determine whether problems exist with oxygenated fuels being incompatible with or able to permeate through materials used in underground storage tank (UST) systems. The fuel oxygenates addressed in this inquiry included two alcohols–methanol (MeOH) and ethanol (EtOH)–and four ethers–methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and diisopropyl (DIPE). Although MTBE is the most widely used oxygenate in the United States, Team 1 included all commonly used oxygenates to broaden the inquiry on potential material compatibility and permeability issues.

1. Definitions

Chemical incompatibility refers to changes in the physical, chemical, or mechanical properties of a material resulting from thermal-chemical exposure, which subsequently alter the performance of a part in ways which induce or enhance new or existing failure mechanisms. For metals, chemical compatibility often implies corrosion resistance. While the term corrosion is not generally used to describe nonmetallic performance, a change in properties due to chemical exposure is often considered a form of corrosion. Important to note is that the same fuel that must be compatible with an UST system must also be compatible with an automotive fuel system. For gasoline, chemical compatibility also means that degradation products, of any, do not contaminate the fuel or impair automotive performance.

Permeation is mass transport, or flux, through a material that is driven by an activity gradient. Activity is a thermodynamic term which is related to the change in the chemical potential with chemical composition. Mass flux is proportional to the permeability coefficient of the solvent-material pair and also the surface area to thickness ratio of a membrane. Gasoline, oxygenated or not, does not absorb into or permeate through metals. The phenomenon of permeation is, thus, limited to certain nonmetals and will typically vary greatly depending upon the type of material in question.

2. Materials in UST Systems

Team 1 considered all the underground and aboveground components of a UST system, including not only the tank, piping, turbine sump, and fittings, but also the dispenser pan and hoses and vapor recovery equipment. Nonmetallic materials commonly found in a retail gasoline station may be classified into three categories: elastomers, thermoplastics, and thermosets. Elastomers are commonly used in flexible hose constructions, seals, gaskets, and packing. An elastomer may be defined as a material which can be stretched beyond its yield point and yet its strain is largely recoverable upon relaxing the applied stress. This strain recovery property is usually obtained by mild cross-linking (three mole percent or less) or vulcanization of a rubbery gum.

Thermoplastics are commonly used in flexible underground piping, sumps, and vapor recovery tubing. A thermoplastic is usually either a semi-crystalline or glassy amorphous material which, upon heating, will reversibly melt into a liquid that may be processed. Thermosets are commonly used in reinforced composites and are found as matrix materials for rigid underground piping and USTs. A thermoset is usually a glassy material which is cured into a highly cross-linked network. Once vitrified, a thermoset cannot be melted and reprocessed like thermoplastics.

The metallic materials commonly found in a retail gasoline station are steel, brass, aluminum, copper, and zinc. Other materials found in UST systems include ceramics, pipe dope, and organic coatings.

B. Approach to Data Gathering

Given that existing data on UST system material compatibility and permeability may be found in both published and unpublished documents, Team 1 undertook two separate research efforts to acquire as much of the available data as possible. First, a review of academic and industry literature was conducted. The sources dated from 1975 to 1997 and most were published documents, although some were unpublished. The review included published industry standards for testing UST equipment, as well as related industry standards (e.g., reference fuels to use in material testing). A technical assessment of the literature is presented in Appendix A. Second, a survey of UST equipment manufacturers was conducted to better understand the nature and extent of compatibility and permeability testing of tanks, piping, and other components of UST systems by third-party entities. The survey instrument developed by Team 1 is presented in Appendix B.

III. FINDINGS

A. Literature Review

1. Compatibility–Metals

The area of concern with metal in UST systems is general corrosion and pitting. The literature review focused on the occurrence of these phenomena caused by oxygenated fuels. The first part addresses ethers and the second part alcohols.

a. Ethers

Data: Very little information is available regarding corrosion of metals by ethers and, in particular, MTBE. Two studies on MTBE and one study on ETBE were identified and reviewed. The first MTBE study looked at corrosion resistance of zinc, aluminum, and brass in neat MTBE and gasoline containing 20 percent MTBE by volume. The second MTBE study examined material damage to the fuel system of a fleet of flexible fuel vehicles using, over an extended period of time, gasoline containing 7 percent MTBE by volume. The ETBE study looked at corrosive effects to galvanized steel, cast iron, magnesium, brass, aluminum, 1018 carbon steel, and terneplate in experimental fuels blended with ETBE but not containing anti-corrosion additives normally used in finished gasoline.

Industry guidance on material usage: No information was identified on usage of ethers or ether-blended gasoline with metal materials.

b. Alcohols

Data: In contrast to the paucity of documented information on corrosion of metals by ethers, a significant amount of data has been published on corrosion by alcohols, the majority from research motivated by concerns about automotive fuel systems. Many general texts may be consulted regarding the phenomenon of metal corrosion by aggressive media.

Industry guidance on material usage: The American Petroleum Institute has published two documents which identify metals recommended and not recommended for use with ethanol, ethanol blends, and gasoline-methanol/cosolvent blends.

c. Industry Testing Standards

In addition to six ASTM standards reviewed (ASTM G1, G31-95, G46-94, G71-81, G119-93, and G133-95), numerous other industry standards have been established for evaluating metal corrosion and/or wear phenomena. In general, these standards call for the use of reference fuels and other test fuels that are same as those specified for standards addressing chemical resistance of non-metallic materials.

d. Conclusions

All three studies involving ethers indicate that no detrimental corrosive effects occur to the metals common to gasoline delivery and fueling systems. Given the data from these studies and the fact that finished gasoline normally contains anti-corrosion additives, gasoline is a rather benign chemical environment from a metals corrosion perspective. The addition of ethers to gasoline does not increase the aggressiveness of the fuel towards metals.

There are numerous material compatibility issues associated with gasohol, and they are well known in the fuel systems industry. Generally, methanol blends are more aggressive than ethanol blends. Metal corrosion problems include general and localized corrosion of active metals, galvanic corrosion, electrolytic corrosion, wear, and aqueous phase separation. Methanol blends with tertiary butyl alcohol are produced which mitigate some material concerns.

2. Compatibility–Non-metals

Elastomer material compatibility primarily concerns swelling, a critical performance factor which involves solvent absorption by the material at equilibrium and affects physical dimensions and mechanical properties of the material. For thermoplastics and thermosets, it is the retention of mechanical properties that is of concern.

a. Ethers

Data: Data on swelling was available from numerous sources for elastomers exposed to MTBE, ETBE, and TAME blends with gasoline in varying percentages by volume; and for thermoplastics and thermosets exposed to MTBE blends with gasoline in varying percentages by volume. By far the most data is reported for elastomer swelling in gasoline blended with varying percentages of MTBE between zero and 100 percent. The impetus for generating these data was to identify materials for automotive fuel systems which would meet the fugitive emission requirements of the Federal Clean Air Act. Data for thermosets, used in UST and rigid piping construction, and to a lesser extent thermoplastics, used in flexible piping and sumps, are predictably sparse since these materials are not used in automotive fuel systems.

Industry guidance on material usage: An API Publication, based on a petroleum industry survey, lists elastomers and polymers in pipeline/terminal components used for non-oxygenated fuels versus those used with oxygenated fuels in pipeline/terminal components; the survey did not distinguish between oxygenated fuels containing ethers versus alcohols.

b. Alcohols

Data: Data on swelling was available from numerous sources for elastomers exposed to methanol and ethanol blends with gasoline in varying percentages by volume; and for a thermoset composite exposed to methanol blended with gasoline at 85 percent by volume. As with metals, methanol blends are more aggressive towards non-metallic materials than are ethanol blends.

Industry guidance on material usage: The American Petroleum Institute has published two documents which identify elastomers and polymers recommended and not recommended for use with ethanol, ethanol blends, and gasoline-methanol/cosolvent blends. Guidance on the use of oxygenates with thermoplastics or thermosets was not identified.

c. Industry Testing Standards

Several industry testing standards suggest chemical resistance performance criteria for nonmetallic piping and tanks. ASTM C 581 is a general standard for chemical resistance of composite materials, specifically that of thermosetting resins used in glass-fiber-reinforced structures intended for liquid service. ASTM D 4021-92 and Underwriters Laboratories (UL) 1316 are standards of safety for glass-fiber-reinforced plastic USTs, and both involve immersion of coupons in test fluids followed by testing of mechanical properties. Both also specify chemical resistance performance criteria, but these criteria differ. The former standard requires at least 50 percent retention of initial material properties for coupons exposed to specified test media (i.e., fuels and other liquids), whereas the latter requires at least 50 percent property retention for coupons exposed to one group of test media and at least 30 percent property retention for coupons exposed to a second group of test media; the sets of ASTM and UL test media are not identical. Similar compatibility testing standards exist for plastic pipe under UL 971 and for pipe connectors, hoses, and seals (plastic and elastomeric) under UL 567. UL follows the same standard procedures for compatibility testing of gasoline hoses; polyethylene sumps with rubber fittings; and rigid, nonmetallic fitting and gasket materials in steel sumps.

For any hardware designed for use in retail gas stations which has undergone third-party testing, there is no evidence to suggest that the hardware would not meet these performance standards in applied use. While the standards mentioned above specify test fuels which include methanol and ethanol blends, none specifically requires that the test fuels contain MTBE or other ethers (in ASTM D 4021-92 a note is made that the purpose of chemical testing is to determine the applicability of tank materials to specific uses, and that the set of test media should include all liquid products to be contained in the tank). However, these standards should allow for equipment to be tested with any fuel blend if the manufacturer makes such a request.

d. Conclusions

No documented material incompatibility issues exist for retail gas stations dispensing reformulated fuels containing ethers up to 15 percent by volume. In concentrations greater than about 20 percent by volume, MTBE and TAME cause swelling of some fluoroelastomers which may be excessive for some applications, specifically dynamic sealing, e.g., in check valves, valve stems, and rotating shafts. Swelling of fluoroelastomers in neat ETBE is substantially lower than in other ethers.

Regarding alcohols, problems posed to polymeric materials include swelling and softening due to absorption of alcohol and extraction of plasticizers and antioxidants. Generally, compatible material alternatives are available, but the extent to which they are utilized in the construction of components for UST system components could not be determined.

A single, comprehensive industry standard for compatibility testing of nonmetallic materials in UST systems does not exist. Neither the federal nor the California UST regulations require UST equipment manufacturers to report third-party testing results for tanks, piping, or other UST system components, as is required for leak detection equipment. Furthermore, results of third-party testing are generally treated as proprietary by the UST equipment industry.

3. Permeability–Non-metals

Any solvent which can absorb into a material will also permeate through it. The phenomenon is therefore limited to polymeric materials. Generally, the presence of oxygenates accelerates permeation of hydrocarbon fuels in elastomers and thermoplastics. The argument has been made that, given the larger molecular size of MTBE compared to methanol, any material which is compatible with methanol will not allow permeation of MTBE. While this idea has become popular wisdom, it is not a rigorous theory, nor should it be a substitute for direct measurement.

The literature review focused on identifying the available data on permeation rates of oxygenated fuels and their separate alcohol or ether constituents. Data for composites (used for rigid piping and USTs), and to a lesser extent thermoplastics (used for flexible piping, sumps, and vapor recovery tubing) are noticeably sparse. This lack of data is explained by the fact that most data on materials permeability (and compatibility) have been reported by the automotive industry for vehicular fuel systems, which do not contain composite materials.

a. Ethers

Data: Permeability data for MTBE-blended gasoline as well for other ether blends are sparse compared to data for alcohol blends. Data on permeability was available from numerous sources for elastomers exposed to MTBE blends with gasoline in varying percentages by volume. Some data for elastomers and thermoplastics used in hoses and flexible piping were identified. No data for fiberglass composites used in construction of tanks and piping were found. However, there is no theoretical reason to expect strong selective absorption of MTBE by isophthalic polyesters. MTBE may be more permeable than TAME. The solubility characteristic of ETBE indicates that it may be substantially less permeable in fluorocarbon elastomers than either MTBE or TAME.

From available data on total mass flow rate due to permeation, an attempt was made in the technical assessment of the literature review (see Appendix A) to estimate the component contribution of MTBE permeation directly to the soil column through buried thermoplastic flexible piping. Assuming 500 square feet of surface area of underground piping, with secondary containment, in a typical gasoline station, the fugitive emission of MTBE is expected to be approximately 8 g/day.

A similar estimate was made for the permeation of MTBE directly to the air through elastomeric dispenser hoses. The estimate required many assumptions. Depending on the total surface area of hoses and other considerations, calculations suggest that up to 10 g/day total MTBE emission may occur from permeation through nitrile rubber (NBR)-based hoses at a typical gasoline station. (The automotive fuel system industry changed to viton-lined NBR hoses to reduce fugitive emissions of total hydrocarbons to meet the requirements of the Clean Air Act of 2 g/day/vehicle. However, viton selectively absorbs and permeates MTBE, relative to the aromatic and aliphatic hydrocarbons, even though MTBE is a minor constituent in gasoline.)

Rather than making theoretical estimates, it would be preferable to directly measure the mass flow of ethers, when dissolved in gasoline, through materials of interest using techniques and instrumentation capable of resolving the quantifying individual chemical species.

Industry guidance on material usage: None was identified pertaining to permeability or resistance to permeation of nonmetallic materials in contact with oxygenated fuels containing ethers.

b. Alcohols

Data: Data on permeability were available from numerous sources for elastomers and thermoplastics exposed to methanol and ethanol blends with gasoline in varying percentages by volume. A limited amount of data were available for permeability of hose constructions to fuels containing alcohols. No data for fiberglass composites used in construction of tanks and piping were found.

Industry guidance: None was identified pertaining to permeability or resistance to permeation of nonmetallic materials in contact with oxygenated fuels containing alcohols.

c. Industry Testing Standards

Permeability testing is required under UL 971 ("Nonmetallic underground piping for flammable liquids"). The test is performed by taking 18 inches of the smallest diameter pipe, weighing it empty, then filling it with the test liquid and sealing it. Samples are weighed every month for 180 days for primary pipe and twice a week for 30 days for secondary pipe. The rate of permeation is calculated monthly and compared to the maximum allowed weight loss for primary pipe of 0.013 oz/ft^2/day (4 g/m^2/day) and for secondary pipe of 0.079 oz/ft^2/day (24 g/m^2/day). There are 10 test liquids, including pure methanol and ethanol, 50 percent blends of each with gasoline, and 10 and 30 percent blends of ethanol with gasoline. No requirement for testing with MTBE blends or other ether blends is specified. UL does have standard procedures for permeability testing of polyethylene sumps. The test duration is at least 30 days and until the permeation rate reaches a constant level; the evaluation criterion is that the permeation shall not exceed 0.25 oz/ft^2/day. Three SAE standards were identified which address permeation requirements for non-metallic tubing and flexible hoses used in automotive fuel systems.

Although UL 567 and ASTM D 4021-92 contain various procedures to test compatibility of pipe connectors and glass-fiber-reinforced polyester USTs, respectively, testing for permeability is not addressed. Similarly, while UL 1316 and ASTM D 4021-92 address compatibility of glass-fiber-reinforced plastic/polyester USTs, they do not contain procedures for permeability testing. ASTM standards for permeation of plastics do exist, but are intended for the food packaging industry, and, as such, focus on oxygen and other gas components rather than hydrocarbons. However, these standards do stress the requirement to achieve steady state permeation.

In summary, standards and procedures do exist for measuring the total hydrocarbon permeability in hoses, sumps, flexible piping, and rigid piping but not for composite USTs. However, the standards do not allow the calculation of mass flow contributions from individual hydrocarbon species. The existing standards are not adequate for steady state measurement of individual oxygenated species, particularly alcohols that may be present in dilute quantities in gasoline. Directly related to this issue, it should be noted that no environmental standards exist at the federal level or in California that limit fugitive emissions for gasoline retail stations, as for automobiles (under the Clean Air Act, the maximum level of fugitive total hydrocarbon emissions per vehicle is 2 g/day, which is a significant decrease from the previous requirement of 24 g/day). Only UL 971, for safe operation of underground piping, suggests a permeability limit for the primary conductor and secondary containment piping.

d. Conclusions

The permeation rate of oxygenated gasoline is greater than nonoxygenated gasoline in common hose materials. In general, alcohol-blended fuels are more permeable than ether blends, with methanol being most aggressive. The permeation rate of ETBE is postulated to be considerably lower than other oxygenates. For both ethers and alcohols, greater permeability in gasoline blends is observed in elastomers (e.g., hoses, seals, gaskets, packing) than in thermoplastics (e.g., flexible piping, sumps, vapor recovery tubing). In general, fluorinated elastomers and thermoplastics offer better permeation resistance than nonfluorinated materials. No successful attempts to measure permeation of ethers or alcohols in pipe or tank composites have been reported. There are not enough data to estimate the total fugitive emission of hydrocarbons from retail gas stations. If the mass flow of ethers or alcohol by permeation through UST system materials is desired, then it must be measured directly.

Questions about permeation of oxygenated fuels through UST system equipment cannot be answered until (1) a standard protocol is developed to directly measure the mass flow of ethers or alcohols, when dissolved in gasoline, through materials of interest using techniques and instrumentation capable of resolving the quantifying individual chemical species; and (2) permeability data are collected for the composite materials used for rigid piping and USTs. Once these are accomplished, a better estimate can be made for oxygenate permeation from a UST system at a retail gas station. Any estimated volume of oxygenates due to permeation over time should be compared to the quantity of oxygenates released during small spills that frequently occur at retail gas stations and other dispensing facilities. An environmentally-based standard for permeability testing may need to be established, as the only permeation standard applicable to UST systems (UL 971) is intended to ensure safe operation of the equipment, not necessarily environmental protection.

4. Compatibility and Permeability–Other Materials

a. Data

The literature review revealed a limited amount of information concerning ceramics, pipe dope, and organic coatings. Concerning ceramic materials, no information about compatibility or permeability issues was found pertaining to oxygenated fuel blends. Several sources in the literature state that freshly applied pipe dope is subject to washing out by gasoline containing alcohol. Some pipe dope is alcohol-based, and the solids may be redissolved if the pipe dope has not had ample time to dry. Washed-out pipe dope can lead to leaks in threaded connectors. Polytetrafluoroethylene (PTFE)-based tape may be utilized as an alternative thread sealant.

Organic coatings, applied to the inside or outside of steel USTs, are used to provide cathodic protection. In a laboratory evaluation, it was found that gasohol tends to extract an epoxy coating from a fuel storage tank. Several sources mentioned the superior performance of urethane-based coatings in automotive finishes for splash exposure to gasohol. Lastly, a series of successful immersion tests have been done involving steel coated with ethylene acrylic acid polymer in 100 percent methanol and gasoline-methanol blends, in which no evidence of laminate deterioration of adhesion loss on any sample was found.

b. Industry Guidance on Material Usage

No guidance was identified on usage of organic coatings with fuels.

c. Industry Testing Standards

Two industry standards exist which address organic coating used to line the interior of USTs–American Petroleum Institute Publication 1631 and National Leak Prevention Association Standard 631. The former standard outlines coating specifications, including immersion tests which should be conducted under certain temperature conditions and time periods using a set of eight test media. Physical property retention after immersion must be at least 30 percent for three of the test media (toluene, xylene, and distilled water) and at least 50 percent for the remaining four test media, which includes gasoline blended with 10 percent ethanol but not methanol or any ether blends. The standard does note that a warranty certifying chemical compatibility is to be provided to the UST owner by the manufacturer before liquids other than the seven test media may be stored. (A copy of the latter standard was not available in time for review.) UL has a standard procedure for testing organic coating in steel sumps, which involves immersion in 21 test media including methanol and ethanol blends, but not specifically ether blends.

d. Conclusions

There is no reason to suspect compatibility or permeability problems with ceramic components in UST systems. Problems with pipe dope washing out can be avoided by following proper installation procedures. Some organic coatings are more suitable for gasohol storage than others. The practice of UST coating manufacturers providing a warranty for use with specific liquids should be continued.

B. <u>Industry Survey</u>

1. Overview

Team 1 developed a one-page, two-sided survey form (see Appendix B) which asked questions related to materials testing. The purpose of the survey was to determine the extent of testing conducted to date for oxygenate compatibility with and permeation in UST system components. The survey was sent out to 257 companies at the end of April 1998. As of the end of September 1998, 25 responses had been turned in. Basic statistics on the extent and nature of survey responses are included at the end of this section.

The companies which received the survey were selected from the Petroleum Equipment Institute's (PEI) 1998 Petroleum Equipment Directory, and specifically the list of equipment manufacturers. The survey responses are not included with this report due to the confidential and proprietary nature of some of the information presented. The surveys were made available to and reviewed by the Team 1 members.

Many of the companies on the PEI list of equipment manufacturers either do not market their products in California or manufacture products which do not come into direct contact with gasoline (e.g., electronic components). This partially explains the low response rate. Another issue leading to low responses was manufacturers' concern about confidentiality and proprietary information. A third possible issue is the lack of testing done by some of the smaller manufacturers. Some verbal comments given to Team members indicate that some manufacturers rely on their larger competitors to do the testing. The smaller companies then use the same raw materials based on the assumption that adequate testing has been performed by the larger companies. There are some systems in use which may have components that are no longer manufactured. The survey responses only covered products currently being manufactured.

2. Summary of Responses

In addition to the response rate falling short of our expectations, only one quarter of the respondents (six companies) furnished some information regarding testing of their products with oxygenates. Of these, the tests of only three companies' equipment included all oxygenates of concern to Team 1. Limited information regarding oxygenate compatibility is occasionally printed in manufacturers sales brochures, some of which were submitted with the survey responses and some which were collected by Team 1 separately. Although neither the Team 1 survey responses nor the sales materials provide analytical test results, except in the case of three respondents, they do offer some level of confidence that manufacturers are testing for material compatibility. A total of four respondents stated they warranty the equipment for storage of specific fuels. Only one specifically includes MTBE, and another mentions "oxygenate blends." Three of the four specifically include alcohols and alcohol-gasoline blends.

The test results provided by respondents included tests on the most commonly used fuel system components. The materials of greatest concern are fiber-reinforced plastics (FRP or fiberglass), polyethylene, high density polyethylene (HDPE) and steel. Gasket materials such as viton, teflon, and rubber were not addressed by any of the survey responses, but they were well-covered in other papers discovered during the literature search.

Typically, material samples were tested with various formulations of gasoline and oxygenates. The compatibility tests generally included immersion of the product sample in the test liquids for varying lengths of time. The samples were then tested for elongation, strength, and swelling as a percentage of their original size and strength. The test results do not indicate any significant differences between samples tested with oxygenates versus those tested without oxygenates. Only one survey response contained information about permeability testing. The product tested was non-metallic piping under UL 971; the test result did not indicate any significant level of permeation as tested.

STATISTICS FROM THE SURVEY OF UST EQUIPMENT MANUFACTURERS			
ALL SURVEY RECIPIENTS		Number	Percent of All Recipients
Companies Who Were Sent the Survey ("Recipients")		257	100
Companies Who Responded to the Survey ("Respondents")		25	10
Recipients Marketing Equipment in CA ("CA Recipients")		89	35
Breakdown:	Underground Storage Tanks	6	
	Underground Piping	8	
	Fuel System Components in Contact w/ Fuel	91	
	Components Not in Contact w/ Fuel	37	
CA RESPONDENTS		Number	
Breakdown:	Underground Storage Tanks	3	
	Underground Piping	3	
	Fuel System Components in Contact w/ Fuel	30	
	Components Not in Contact w/ Fuel	7	
ALL SURVEY RESPONDENTS		Number	Percent of All Respondents
Respondents Providing Compatibility Test Results		6	24
Respondents Providing Permeability Test Results		1	4
Respondents Specifying Warranties with Specific Fuels		4	16

IV. RECOMMENDATIONS

A. Collect Additional Data on Permeability of Oxygenated Hydrocarbons

1. Establish reliable and scientifically defensible techniques for determination of the individual contribution of the oxygenated hydrocarbon component to total permeability of gasoline blends in materials of construction commonly found in retail gasoline stations.

2. Directly measure the permeability of MTBE and other oxygenated hydrocarbons in these materials, including the comparative permeation rates of ETBE versus MTBE. From these data and geometrical considerations of UST systems, estimate the total fugitive emission rates to air and soil of oxygenated hydrocarbons via permeation through common retail gas station equipment.

B. Establish Environmental Standards for Compatibility and Permeability Testing

1. A standard or set of standards should be developed through a cooperative effort between government, the petroleum equipment industry, and nationally-recognized independent testing organizations to establish uniform criteria for material compatibility and permeability testing with conventional and oxygenated fuels which are environmentally protective, in addition to ensuring safe operation. For compatibility testing, the existing standards could be consolidated along with or in addition to establishing consistent criteria for swelling, physical property retention, and other compatibility measures. For permeability testing, new standard(s) and criteria for permeation need to be developed.

2. Results of material compatibility and permeability testing with conventional and oxygenated fuels should be made readily available to any interested party.

3. New fuel formulations should be tested for UST system compatibility before they are introduced for wide-scale use.

V. ATTACHMENTS

ATTACHMENT A

Compatibility and Permeability of Oxygenated Fuels to Materials in Underground Storage and Dispensing Equipment

A Technical Assessment of the Literature circa 1975-1997[1]

Prepared by:
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&
Team 1 -- Oxygenate Compatibility and Permeability

Submitted to:
State Water Resources Control Board's Advisory Panel
January, 1999

[1] litrev2.doc

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1.0 Executive Summary

No material incompatibility concerns associated with storage and dispensing of methyl tertiary butyl ether (MTBE) blended gasoline at retail facilities have been documented. Gasoline containing up to 15 percent by volume of MTBE will not induce or enhance new or existing failure mechanisms in metallic or nonmetallic components. Additionally, the performance properties of the fuel itself, in contact with the construction materials, are not altered in ways which lead to impairment of vehicle performance. These observations are in contrast to the well documented aggressive character of alcohol blended fuels toward certain metals and polymers alike as well as certain vehicle driveability concerns.

Gasoline, oxygenated or not, does not absorb into or permeate through metals. The phenomenon of permeation is thus limited to certain nonmetals and will typically vary greatly depending upon the type of material in question. Permeation of gasoline through composite materials typical of fiberglass tanks, rigid piping and sumps *has not been observed* despite two reported attempts to measure it. As such, permeation of fuel components through fiberglass directly into the ground is expected to be very low, perhaps below detectable limits. Permeation of reformulated gasoline through thermoplastic and elastomeric materials typical of flexible hoses and piping has been observed. Most of this fugitive hydrocarbon emission is produced directly into the air.

There is not enough data to estimate the total fugitive emission of hydrocarbons and, especially, the individual contribution due to oxygenates permeating through all polymeric membranes at a retail facility. Where data is available, the component contribution of the oxygenated hydrocarbon to the total hydrocarbon permeation is not reported. In the case of elastomer hose construction, theoretical considerations may allow one to estimate the mass flow due to MTBE component permeation. This contribution is expected to be less than ten grams per day per station.

Absorption and permeation of alcohol blended fuels in and through polymeric materials are observed to be of considerably greater magnitude than that observed for ether blended fuels. As with MTBE, component contribution due to alcohol permeation alone is unknown. However, theoretical and practical considerations prevent the estimation of the component contribution of alcohol permeation, even in elastomers.

Direct observation of the permeation rate of MTBE and other oxygenated hydrocarbons in composite, plastic and elastomeric materials of construction is recommended for further study.

2.0 Scope

This review discusses metallic and nonmetallic materials compatibility to gasoline containing various concentrations of oxygenated hydrocarbons. Permeability of oxygenated gasoline through nonmetallic materials is also discussed. Documentation published during the 1975 through 1997 time frame is used as the primary source material.

Although the current interest is focused primarily on the effects of methyl tertiary-butyl ether on materials of construction in retail facilities, this review discusses the effects of other common oxygenated additives such as alcohols and other ethers. Both above-ground and buried components are considered. A broad scope is offered for two reasons. First, a study of the effects of both alcohols and ethers will increase awareness of the various chemical phenomena that are manifest when materials are brought into contact with various oxygenated fuel blends. Second, should alternate oxygenated hydrocarbons be considered for addition to automotive fuels, it is hoped that this document may serve as a beginning reference for materials considerations.

Installation and operational procedures and practices are not considered in this review.

3.0 Technical Summary

3.1 Materials Compatibility with Oxygenated Gasoline

There is general agreement among observers that, if a material is resistant to alcohol blended fuels, it will be resistant to ether blended fuels as well. Although there is some merit to this assertion, it has led to considerably more documentation of materials issues involving alcohol blended gasoline.

Even so, there are no documented materials incompatibility issues associated with storage and dispensing of MTBE blended gasoline. From a metals corrosion viewpoint, gasoline is a rather benign liquid and MTBE does not increase the corrosiveness of the hydrocarbon blend.

From a polymer compatibility viewpoint, neat MTBE is an aggressive swelling agent for some, but not all, polymers. The mitigating factor for polymer compatibility in a reformulated gasoline environment is that the swelling power of MTBE is diluted in approximate proportion to its volume fraction in solution. At 15 percent concentration in gasoline, the effects of MTBE do not compromise equipment integrity.

Conversely, the corrosive nature of alcohol blended fuels with regard to metals and polymers alike is well documented. Even dilute alcohol blends are more aggressive to materials than any of the pure components. Methanol is more aggressive than higher molecular weight alcohols.

Key to the nature of metal corrosion by gasohol containing gasolines is the role of trace components in the fuel, such as water, chloride ion, sulfur compounds, pH, etc., and also alloying elements such as copper. Lead, zinc, aluminum, magnesium, and other metals are actively corroded under certain conditions.

Swelling of polymers is enhanced by alcohols through the various associations possible among solvent-solvent and polymer-solvent interactions. Even in relatively dilute alcohol blends, considerable loss of stiffness and strength are caused by plasticization and are well documented for many polymeric materials.

Introduction of trace concentrations of water (ca. 1000 parts per million) into alcohol blended fuels often passivates corrosion of some metals and reduces absorption into some polymers. However, hydrated gasohol may introduce new degradation mechanisms for materials. Close to the water content required for passivation of corrosion, aqueous phase separation occurs. The electrical conductivity of hydrated fuel is increased to the point where galvanic and electrolytic corrosion may be enabled. Considerable loss of lubricity, leading to increased wear of wetted parts, is also observed near the point of phase separation. Corrosion and/or wear products may become entrained in the fuel and cause subsequent drive ability issues for customers vehicles.

3.2 Permeability of Polymeric Materials to Oxygenated Gasoline

Likewise, permeability data for MTBE blended gasoline are sparse compared to alcohol blends. There are not enough data to estimate the total hydrocarbon fugitive emission due to permeation from retail gasoline stations. No data for fiberglass composites common to tanks and piping are found. Some data for elastomers and thermoplastics common to hoses and flexible piping are available.

Generally, the presence of oxygenates accelerates permeation of hydrocarbon fuels in elastomers and thermoplastics. Alcohols, particularly methanol, produce more excess permeation than does MTBE. Among ethers, MTBE may be more permeable than TAME.

Since observers report total mass flow due to permeation, without consideration of component contributions, estimating the contribution of MTBE to the total mass flow through a membrane requires theoretical techniques which may be questioned. For alcohols, deconvolution of the data are not possible due to substantial excess permeation. Therefore the mass flow of oxygenates (when dissolved in gasoline) through materials of interest, should be measured using techniques and instrumentation capable of resolving and quantifying individual chemical species.

From the available data, an attempt to estimate the component contribution of MTBE permeation through hoses is made in this paper. Many assumptions are involved. Depending on the total surface area of hoses and other considerations, calculations suggest that up to 10 grams total MTBE emission may be observed from permeation of nitrile rubber (NBR) based hoses per station, per day. Permeation through hoses contributes to direct evaporative emission to the air and not the soil.

3.3 Technologies to Reduce Permeation of Oxygenated Hydrocarbons

Incorporation of a thermoplastic liner in flexible hose constructions, similar to liners found in some flexible underground piping, may reduce the total permeation of hydrocarbons including MTBE.

The solubility characteristic of ETBE indicates that it may be substantially less permeable in fluorocarbon elastomers than either MTBE or TAME. Lower permeability of ETBE is likely to be observed in polar polymers and is related more to stereo-chemical effects than to molecular size.

4.0 Definitions

Definitions of chemical compatibility, permeability and the chemical environments of interest in this document are defined below.

4.1 Chemical Compatibility

Chemical compatibility refers to changes in the physical, chemical or mechanical properties of a material resulting from thermal-chemical exposure. Any property change should not alter the performance of a part in ways which induce or enhance new or existing failure mechanisms.

For metals, chemical compatibility often implies corrosion resistance. While the term corrosion is not generally used to describe nonmetallic performance, a change in properties due to chemical exposure is often considered a form of corrosion.

For the gasoline, chemical compatibility must also mean that degradation products, if any, must not contaminate the fuel and impair automotive performance.[1]

4.2 Chemical Permeation

Permeation is mass transport, or flux, through a material that is driven by an activity gradient. Activity is a thermodynamic term which is related to the change in the chemical potential with chemical composition. Mass flux is proportional to the permeability coefficient of the solvent-material pair and also the surface area to thickness ratio of a membrane.

4.3 Thermal-Chemical Environment

Gasoline is a blend of aliphatic, olefinic and aromatic hydrocarbons and also, more recently, oxygenated hydrocarbons. Other organic additives such as corrosion inhibitors and detergents are also common. However, it has been shown that there are no measurable effects of these additives on elastomer performance factors.[2] Thus, for compatibility and permeability testing, model gasolines generally contain iso-octane and toluene in various proportions. An oxygenated hydrocarbon, or oxygenate, has at least one covalently bonded oxygen atom in the molecule. Generally, oxygenated additives for gasoline contain alcohol or ether functional moieties.

Over the past 25 years, oxygenates have been added to increase the octane number of gasoline and, more recently, to comply with Federal and State automotive emissions standards. These standards require addition of an oxygenated hydrocarbon to gasoline such that it will contain a specified weight percentage of bound oxygen. Depending on the molecular weight of the additive, up to 15 percent by volume of added oxygenate may be required to meet regulatory requirements.

Reformulated gasoline may be composed of hydrocarbons blended with ethers such as methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE) tertiaryamyl methyl ether (TAME), and perhaps others.

Gasohol may be composed of hydrocarbons blended with alcohols such as methanol (MeOH), ethanol (EtOH), tertiarybutyl alcohol (TBOH), amyl alcohol (AmOH), and perhaps others. The term Gasohol is usually confined to blends containing ethanol up to 10 percent by volume. Higher volume alcohol blends, such as 85 percent MeOH are also known.

Ambient temperatures are expected to range between zero and 120 °F. Although underground equipment may not experience such wide temperature fluctuations, the product dropped into the tank may be delivered at various ambient temperatures.

Operating pressures are expected to range between atmospheric and 60 pounds per square inch gauge (psig).

4.4 Basic Data

Table 1 summarizes some chemical and thermodynamic data for constituents commonly used to study chemical compatibility with oxygenated fuels. ASTM Reference Fuel C is composed of a 50 percent by volume blend of iso-octane and toluene. Oxygenated hydrocarbons are added to this mixture to obtain a blend of interest.

Table 1 - Properties of hydrocarbons commonly used in compatibility and permeability studies.

Chemical	Formula	Mole Weight	Vapor Pressure @ 100°F	Density g/cc @20 °C	Boiling Point °F	ΔH_{vap} BTU/lb
Isooctane	C_8H_{18}	114.2	1.70	0.6919	210.6	116.7
Toluene	C_7H_8	92.1	1.00	0.8660	231.1	156.2
MeOH	CH_4O	32.0	4.60	0.7915	148.1	502.0
EtOH	C_2H_6O	46.0	2.30	0.7890	173.0	396.0
TBOH	$C_4H_{10}O$	74.1		0.7857	180.3	
AmOH	C5H12O	88.2		0.8083	216.5	
MTBE	$C_5H_{12}O$	88.2	4.73	0.7404	131.4	138.0
ETBE	$C_6H_{14}O$	102.2				
TAME	$C_6H_{14}O$	102.2				
DIPE	$C_6H_{14}O$	102.2		0.7258	155.0	

5.0 Theoretical Overview

5.1 Chemistry of Oxygenated Hydrocarbons

It is important to briefly consider the chemistry of oxygenated hydrocarbons in order to establish their stability and propensity to form other compounds in gasoline. The chemical behavior of oxygenated hydrocarbons in solution governs the behavior of materials in contact with them.

5.1.1 Oxidation of Ethers

During prolonged storage in the presence of air, some aliphatic ethers are known to slowly oxidize to form peroxides in low concentrations.[3] Peroxides can be unstable and hazardous in the presence of hydrocarbons and other materials. Moreover, they serve to reduce octane number by a disproportionate amount. Ethers with alpha hydrogen atoms attached to the carbon adjacent to the ether linkage, such as diisopropyl ether, DIPE, are most susceptible to this type of oxidation reaction as illustrated below.

$$(R)_2\text{-CH-O-R'} + \tfrac{1}{2}O_2 \rightarrow (R)_2\text{-CH-O-O-R'}$$

MTBE and TAME, with no labile methylene hydrogen atoms will be least prone to undergo this type of oxidation under normal ambient storage conditions.

Peroxide formation in gasoline reformulated with ETBE and without normal antioxidant levels was tested for six months at room temperature with periodic exposure to air. Tests show a minor amount of peroxide formation.[4] The peroxide level was deemed negligible with respect to hazard or octane detriment. Therefore peroxide formation in MTBE, TAME, and ETBE reformulated gasolines should not be an issue especially since antioxidants are added to prevent oxidation of olefins also present in the fuel. Furthermore, air exposure to gasoline in transportation and storage equipment is limited.

Another author considered peroxide formation in automotive fuel return lines.[5] This concern is primarily due to the increased temperature of the fuel and is not considered an issue for the retail environment.

5.1.2. Alcohols as Bases

Alcohols may act as a base in the presence of active metals.[6] The reaction products include an alkoxide anion and the metal cation as shown below:

$$ROH + M \rightarrow RO^- + M^+ + \frac{1}{2}H_2$$

The smaller the alkyl group, the more acidic the alkoxide acts. Methanol forms the strongest anion and tertiary alcohols the weakest. This reaction explains the rapid corrosion phenomenon observed for active metals such as magnesium and aluminum in dry alcohol solutions, particularly methanol.

Citing this reaction, Hertz[7] indicated that an alkoxide ion would subsequently be reactive to elastomers and other nonmetallic materials. However, because an hydroxide ion is a weaker base, the alkoxide is very short-lived in the presence of even trace amounts of water. Water reacts with the alkoxide ion to produce the alcohol back again and the metal hydroxide. Since water is common in gasoline distribution and storage systems, degradation of materials by alkoxide ions is not considered to be an important mechanism.

Unlike some ethers, alcohols are not known to oxidize under normal ambient storage conditions.

5.1.3. Hydrogen-bonding of Ethers and Alcohols

Unlike non-oxygenated hydrocarbons found in gasoline, alcohols and ethers are electrostatically dipolar molecules. That is, certain moieties in the molecule carry a partial positive charge and others in the same molecule carry a partial negative charge. This charge polarization creates attractive forces among complementary charged moieties of other similar or dissimilar molecules.

Due to the electronegativity of oxygen atoms relative to carbon and hydrogen, the oxygen atoms of both an ether or an alcohol (hydroxyl) group carry a partial negative charge. The two pair of unshared electrons in the oxygen atom of both groups make those moieties proton acceptors or "Lewis bases." Both carbon atoms adjacent to the ether oxygen carry smaller partial positive charges. In contrast, the hydroxyl group contains a partially positive hydrogen atom. This positive charge on a hydrogen atom makes it weakly acidic. Thus, the hydroxyl group is said to be a proton donor, or a "Lewis acid", as well as a Lewis base.

Lewis acids and Lewis bases are attracted to one another through a process called hydrogen-bonding. Water is perhaps the most familiar of hydrogen-bonding substances. Strong hydrogen bonding is responsible for some of water's interesting properties such as high melting and boiling temperatures. In hydrogen-bonding, one acidic proton is shared between two basic sites by mutual coulombic attraction of the proton. A review of the theoretical concepts associated with hydrogen bonding phenomenon is beyond the scope of this paper but an excellent review may be found elsewhere.[8]

As a result of hydrogen bonding, alcohols are attracted both to each other and to other molecules with Lewis base sites. In contrast, because ethers have no acidic hydrogen atoms, they show very little affinity for each other but will be attracted to Lewis acids, if present in solution. Further, both ether and alcohol based solvents will hydrogen-bond with Lewis acid sites that may be present in polymeric materials. This phenomenon leads to excess swelling and these concepts will be discussed further in the section on Corrosion Mechanisms.

Favored by an exothermic interaction energy, associated species of Lewis acids and bases are present in solution along with their parent species. For example, it has been shown that neat methanol may exist as a hydrogen-bonded cyclic tetramer.[9] Both the neat alcohol monomer and an associated species exist in equilibrium. The concentration of each species will depend on an equilibrium constant, k, which, in turn, depends on the association energy of the hydrogen-bonded species relative to the absolute temperature. An equilibrium reaction may be written to describe this type of solvent-solvent self-association as follows:

$$\mathrm{nMeOH} \underset{k}{\longleftrightarrow} (\mathrm{MeOH})_n$$

Hydrogen-bonded oligomeric species have unique chemical properties just as covalently-bonded monomeric species do. As such they are able to interact with materials in a similar manner as their disassociated parent species.[10] Insofar as chemical interaction with materials is concerned, some self-associating solvents like alcohols must be considered as multicomponent solvent blends of polar and non polar solvents even when they are pure. Methanol, existing as the monomeric species, is quite polar; whereas methanol existing as a tetramer, is considerably less polar. For this reason, self-associating solvents like dry methanol and chloroform are often powerful swelling agents for both polar and, surprisingly, nonpolar polymers alike. Small quantities of added water tends to break-up the tetramer methanol species and lower swelling has been observed for FKM-66 copolymer elastomers (myers and abu-isa) in hydrated methanol.

5.2 Solution Thermodynamics

Electrostatic interaction of chemical species in solution creates other interesting behavior in gasoline blended with ethers and alcohols. One must also consider the change in chemical potential of a solution as new species are introduced. The resulting activity of a solvent in solution has been shown to play an important role in determining equilibrium absorption of solvent by a material.

5.2.1. Ideal solutions

An "ideal solution" is defined as one in which the enthalpy of mixing the components is zero. In an ideal solution, the activity of each species is equal to its mole fraction in solution. The activity coefficients, defined as the activity of each component divided by its mole fraction, are therefore equal to unity. In ideal solutions, most linear blending rules used for solution property correlations, such as Rault's law for vapor pressure, are obeyed.

In general, gasoline which contains a blend of aliphatic, olefinic and aromatic hydrocarbons is considered to be an ideal solution. Addition of oxygenated hydrocarbons in the form of ethers does not appreciably change the ideal behavior of gasoline. Because an ether is a Lewis base, some minor interaction among the pi electrons of aromatic species and the ether is known. However, there is not enough chemical interaction in an ether blended gasoline to invalidate the ideal solution assumption for most applications. The activity coefficients of all components in reformulated gasoline are approximately equal to one.

Figure 1 illustrates this ideal behavior. The activities of MTBE, toluene and iso-octane in model fuels containing various concentrations of MTBE are approximately equal to their mole fraction in solution.

The vapor phase composition may be easily computed from equations governing vapor-liquid equilibrium. The mole fraction x_i, the activity coefficient γ_i, and the vapor pressure $\mathbf{P}_i$ of each component in the liquid phase must be known. Assuming the vapor is an ideal gas, the equilibrium vapor composition y_i may be computed as follows:[11]

$$\mathbf{y}_i = \frac{\gamma_i x_i P_i}{\sum \gamma_i x_i P_i}$$

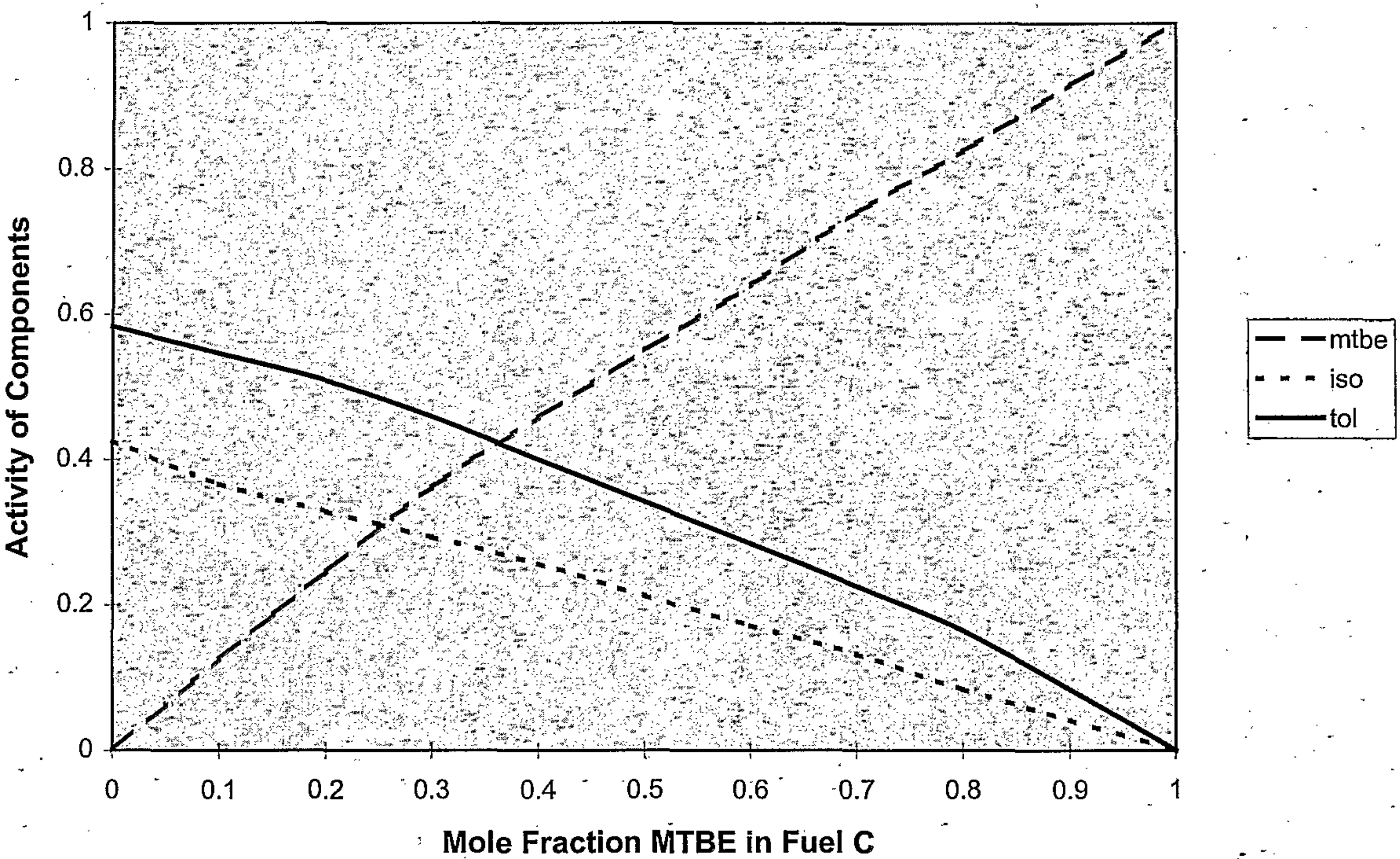
For ideal solutions, the activity coefficients are equal to one and the vapor phase composition scales linearly with the mole fraction of components in the liquid. Further, the molar volumes are approximately equal; thus, volume fractions are approximately equal to the mole fractions. This simple calculation is conducted for 15 percent by volume MTBE blend in ASTM Fuel C.

Table 2 - Approximate compositions of vapor liquid equilibrium for a 15 percent by volume blend of MTBE in ASTM Fuel C.

Component	x_i	a_i	P_i	$a_i P_i$	y_i
Isooctane	0.425	0.425	1.7	0.723	0.390
Toluene	0.425	0.425	1.0	0.425	0.229
MTBE	0.150	0.150	4.7	0.705	0.380
total	1.000			1.853	0.999

It is observed in **Table 2** that the mole fraction of MTBE in the vapor phase, y_i, is about 2.5 times greater than its mole fraction in the liquid, x_i. This concentrating effect of the oxygenated

Figure 1 **Activity of MTBE, Toluene and Isooctane as a function of ether concentration in Fuel C**



component in the vapor phase is due to the elevated vapor pressure of MTBE relative to the other hydrocarbon constituents.

5.2.2. Non-ideal solutions

Both positive and negative deviations from ideal solution behavior are possible whenever polar interaction among species in solution occurs. Alcohol blended fuels exhibit positive deviations where the activity coefficients are much greater than one. This deviation is a direct result of the interaction that alcohol molecules have for each other. Driven by the entropy of dilution with non-polar gasoline, the heat of mixing is endothermic because the self-associating alcohol species are being dissociated.

Figure 2 illustrates this non-ideal solution behavior. The activities of EtOH, toluene, and iso-octane are all considerably greater than their mole fraction in solution. Since the total pressure is the sum of component vapor pressures multiplied by the component activities, the vapor pressure of a blend of alcohol and gasoline is greater than the vapor pressure of the neat components.

Another practical implication of the high activity of alcohol in gasoline blends containing more than 10 percent alcohol is the tendency for phase separation. By definition, if the activity of any blend component equals one, then phase separation occurs. It is well known that, depending on the temperature and the aromatic content of the gasoline, addition of 0.5 percent by volume water to gasoline blends containing 10 percent EtOH or more will cause aqueous phase separation. Methanol blends are even more sensitive to water. Here, an alcohol molecule prefers to separate into an aqueous phase where it has an exothermic hydrogen-bonding interaction with water rather than remain in the hydrocarbon fuel where its heat of mixing is endothermic.

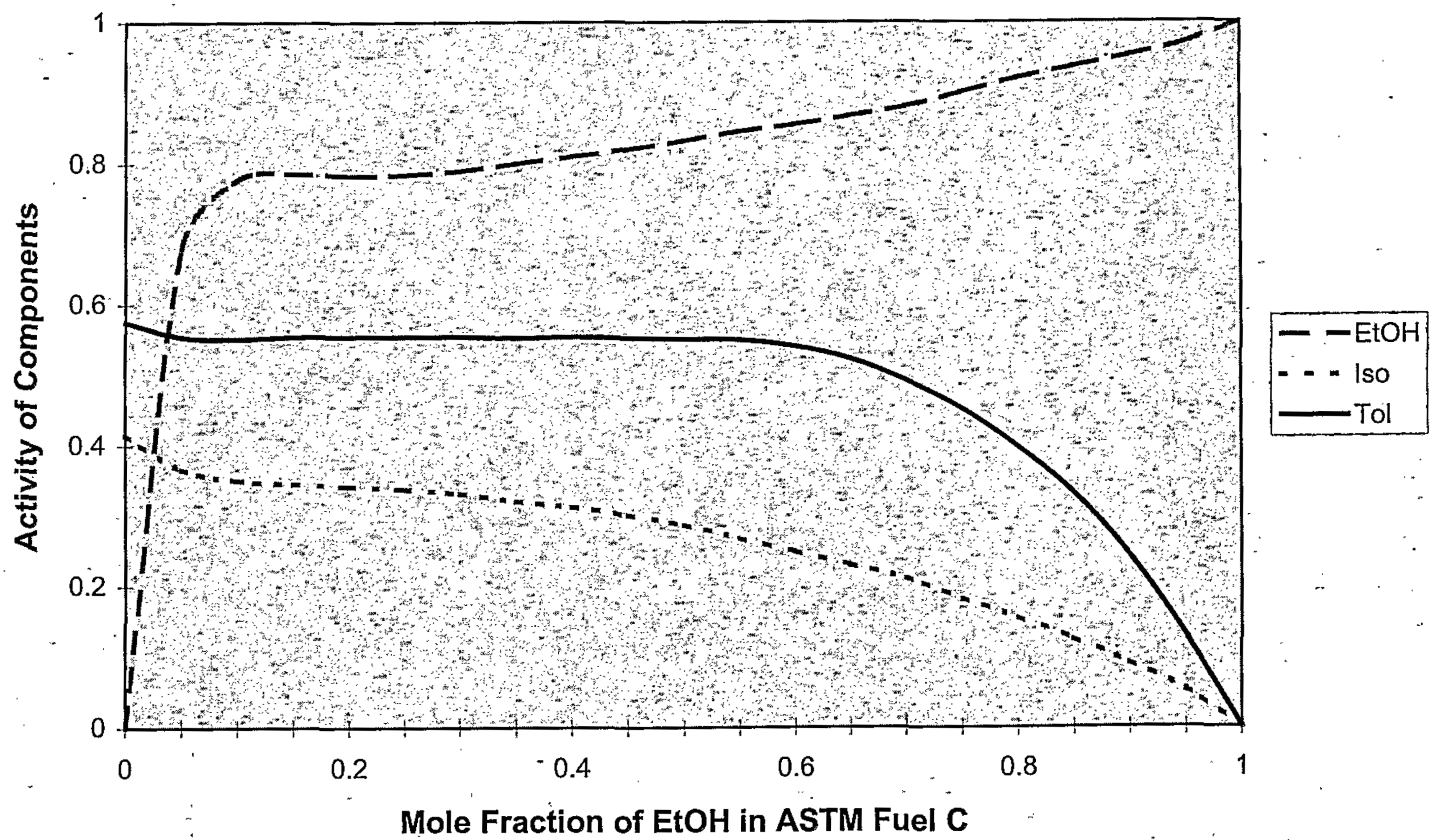
Now consider the vapor liquid equilibrium for MeOH blended fuels. For non ideal solutions, the activity coefficients are not equal to one and the vapor phase composition scales linearly with the activity of the components in the liquid. A further accounting is required for the difference in molar volumes among the species. Assuming again that the vapor phase is an ideal gas, the calculation is repeated for a 10 percent by volume MeOH blend in ASTM Fuel C.

Table 3 - Approximate compositions of vapor liquid equilibrium for a 10 percent by volume blend of MeOH in ASTM Fuel C.

Component	x_i	a_i	P_i	a_iP_i	y_i
Isooctane	0.375	0.45	1.7	0.765	0.149
Toluene	0.375	0.45	1.0	0.450	0.088
MeOH	0.250	0.85	4.6	3.910	0.763
total	1.000			5.125	1.000

It is observed in **Table 3** that the mole fraction of MeOH in the vapor phase is about five times greater than its mole fraction in the liquid. This is due to its relatively high vapor pressure as well as its non ideal behavior in the hydrocarbon liquid. Furthermore, the vapor pressure of the

Figure 2 Activity of EtOH, Toluene and Isooctane as a function of Alcohol Composition in Fuel C



blend is much greater than any of the neat constituents.[12] [13] [14] Similar non-ideal behavior is also observed for ethanol blends.

These phenomena, higher vapor pressure of the blend and also phase separation sensitivity, observed in gasolines blended with alcohol are indications that a greater driving force exists for alcohols to leave dilute solutions with gasoline than there is for ethers to leave reformulated gasoline. The relative magnitude of this driving force has further implications regarding compatibility and permeability issues for nonmetallic materials. These issues will be more fully discussed in the following sections.

6.0 Corrosion Mechanisms

6.1 Non-Metals

Non-metallic materials do not corrode by electrochemical processes as metals do. This is because nonmetals are dielectric materials which cannot conduct corrosion currents and most do not form stable ionic species. However, dimensional changes and mechanical property changes observed in nonmetallic materials are directly attributable to absorption of hydrocarbons and the resultant swelling and plasticization. These concepts will be discussed below.

Nonmetallic materials commonly found in a retail gasoline station may be classified into three categories: elastomers, thermoplastics, and thermosets.

An elastomer may be defined as a material which can be stretched beyond its yield point and yet its strain is largely recoverable upon relaxing the applied stress. This strain recovery property is usually obtained by mild cross-linking (three mole percent or less) or vulcanization of a rubbery gum. Elastomers are commonly used in flexible hose constructions, seals, gaskets and packing.

A thermoplastic is usually either a semi-crystalline or glassy amorphous material which, upon heating, will reversibly melt into a processable liquid. Thermoplastics are commonly used in flexible underground piping, sumps, vapor recovery tubing, etc.

A thermoset is usually a glassy material which is cured into a highly cross-linked network. Once vitrified, a thermoset cannot be melted and reprocessed like thermoplastics. Thermosets are commonly used in reinforced composites and are found as matrix materials for rigid piping and underground storage tanks (UST).

A brief theoretical description of swelling and permeation phenomena which occur in these classes of polymeric materials is presented in the following sections.

6.1.1. Equilibrium Swelling of Nonmetallic Materials by Solvents.

A critical performance factor for nonmetallic materials exposed to a mixed chemical environment is the degree of solvent absorption by the material at equilibrium. Swelling not only affects the physical dimensions of a part but the mechanical properties are affected as well.

Given an observation of elastomer swell in a pure solvent, $\nu_{i,E}$, Flory[5] suggested that the activity coefficient of a solvent absorbed in an elastomer, $\Omega_{i,E}$, may be estimated from a solvent-elastomer interaction parameter, $\chi_{i,E}$, and an elastic retraction constant, ε, as follows:

$$\mathbf{Ln}\ (\Omega_{i,E}) \cong \nu_{i,E} + \chi_{i,E}\ \nu_{i,E}^{\ 2} + \varepsilon\ (\nu_{i,E}^{\ 1/3} - \nu_{i,E}/2) \qquad \mathbf{2}$$

The first term on the right hand side of **Equation 2** accounts for the dilution entropy of the solvent in the elastomer. The second term expresses the enthalpy of dilution. The last term expresses a contribution to chemical potential due to the elastic retraction energy in the material.

Although this theory was intended only for elastomers exposed to pure solvents, it provides a useful framework to qualitatively discuss the compatibility of many polymeric materials exposed to solvents. For example, the elastic retraction parameter is proportional to the number density of cross-links in the neat material. Since thermosets are cross-linked more than elastomers they typically swell less than elastomers in any given solvent.

More important is the role of the polymer-solvent interaction parameter, $\chi_{i,E}$. If this value is zero, then no interaction enthalpy exists and intermediate swelling is observed. This type of swelling is driven by entropy and opposed by elastic retraction energies. This case is typical of non-polar polymers exposed to conventional non-oxygenated gasoline.

If the polymer-solvent interaction parameter is positive, the resulting interaction is endothermic. Endothermic interaction implies that the polymer prefers interaction with itself rather than with the solvent molecules. The resulting solvent absorption will be very low because swelling is opposed by the heat of mixing as well as elastic retraction. This behavior is the basis for one strategy of obtaining fuel resistance: incorporate acid-base sites into the polymer backbone which, in turn, repel the non-polar solvent molecules in non-oxygenated gasoline. Most fluorocarbon elastomers, nitrile rubber and polychloroprene elastomers, for example, gain their resistance to gasoline in this way.

If the value of $\chi_{i,E}$ is negative, then the enthalpy of mixing polymer and solvent is exothermic. Exothermic interaction implies that complementary attractive forces exist between Lewis acid and/or Lewis base sites on the polymer backbone and on the solvent molecule. In such cases, swelling will be relatively great because it is driven by the enthalpy and the entropy of mixing. This type of interaction may occur when polar polymers come into contact with polar oxygenated hydrocarbons.

The degree of solvent uptake in a material depends on both the activity of the solvent molecule in solution and the interaction parameter of the polymer-solvent pair. For the case of small interaction parameters (i.e. aggressive solvents), a further simplification to Flory's model has been shown to be useful. The three component energy balance may be estimated by a series of partition coefficients. This simplification is valid provided that one partition coefficient is assigned for each species present in solution, associated or not. Therefore, the volume fraction of a mixed solvent absorbed in a material, **C**, is related to the product of the solvent activity in solution $\mathbf{a}_i$ and a partition coefficient. The partition coefficient, or solubility **S,** is the volume fraction of pure solvent absorbed at unit activity.

$$\mathbf{C}_i = \mathrm{S}_i\, \mathbf{a}_i \qquad \mathbf{3}$$

This expression for liquid partitioning into materials at equilibrium is analogous to Rault's Law for vapor liquid equilibrium. The volume fraction of solvent in the elastomer, rather than the volume swell or weight gain, is a useful way to characterize the swelling power of ideal solutions. This utility for gasoline reformulated with MTBE has been shown on a theoretical as well as experimental basis. Thus, for substantial swelling to occur, both the solvent activity *and* the solubility must be greater than zero, and either one should be relatively large.

In a review article, Davidson[15] refers to the increased mole fraction of oxygenated hydrocarbons in the vapor phase relative to the liquid phase which was discussed in the previous section. He poses an interesting question regarding the potential for excess swelling and permeation in the vapor recovery system and in the head space of an UST as a result of this compositional difference.

The key to understanding this swelling problem is to recall that it is an activity gradient which drives swelling of polymeric materials by solvents, not necessarily concentration. From a theoretical standpoint, as long as the saturated vapor phase is in thermodynamic equilibrium with the liquid phase, the activities of each component in both phases are equal. Therefore the vapor cannot be a more aggressive swelling media than the liquid. However, under some conditions, the reverse may be true. If the components in the liquid phase are strongly self-associating, such as with alcohols, then the vapor phase may be a less aggressive swelling media. This is because the associated species does not partition into the vapor phase (being an ideal gas). If the associated species accounts for a significant contribution to the total swell, then the vapor phase may actually be a weaker swelling media.

If the enriched vapor phase is allowed to condense in some region away from the mother liquor, then there is a potential for increased swelling and permeation. Condensing a saturated vapor may occur by either increasing the pressure or decreasing the temperature. If temperature is decreased, then this may be a temporary condition. When reheated, the liquid will return to the vapor phase. If the pressure is increased, due to some processing step in the recovery system, then there is indeed increased potential for swelling and permeation of polymeric materials.

6.1.2. Unsteady Mass Flow of Solvents through Nonmetallic Membranes:

The preceding discussion concerned equilibrium absorption of solvents by polymeric materials. The present section reviews the kinetics of mass transport into and through a polymer membrane. A study of the kinetics of absorption and permeation leads to an understanding of experimental parameters required to reach equilibrium absorption and steady state permeation. Later in this review, some literature permeation data will be interpreted using linear diffusion kinetics as summarized in the following discussion.

Most observers of gasoline permeation report total permeability and permeance (permeance is the permeability coefficient normalized by the thickness of the membrane) values for the fuel blend. However, desired information regarding the permeation rate of individual components, such as MTBE, are not reported. If applicable, mathematical analysis of permeation data from mixed solvents as a function of concentration may yield information regarding the individual contributions to the total mass flow. Therefore a discussion regarding the limitations of such an analysis is warranted. A more complete discussion of these issues may be found elsewhere.[16]

Linear diffusion kinetics are often referred to as Fick's Law or Case I diffusion. Case I diffusion in materials usually holds for vapors such as oxygen, helium, etc.; but, may not be valid for diffusion of solvent liquids. The key assumption in Case I diffusion is that the diffusion coefficient is independent of concentration of solvent in the material. Increasing diffusion coefficient with concentration is usually observed for strongly absorbing solvents. A convenient way to relax this constraint is to perform piecewise analysis whereby diffusion coefficients are valid over limited concentration ranges.

Case II diffusion is another useful theoretical construction where there is an abrupt transition between solvated material and unsolvated material. Here the diffusion coefficient is several orders of magnitude greater in the solvated material. The abrupt change in diffusion coefficient is often associated with a change in morphology in the host material such as glassy to rubbery phase transition. For example, Case II diffusion has been observed for strongly associating solvents, such as methanol, permeating glassy polymers, such as polymethylmethacrylate. Case II diffusion is the dominate mechanism for methanol permeation in fiberglass laminates.

As with swelling, activity gradients drive permeation as well. For permeation of vapors, the activity gradient is often expressed as a change in pressure on either side of a membrane. Henry's law is used to assign coefficients which describe the concentration of permeant in the membrane as a function of its partial pressure. However, pressure will have little if any effect on the activity of a liquid permeant. Therefore activity (not necessarily concentration) gradients are used to represent the driving force for mass transfer. **Equation 3** is used to describe the concentration, by volume fraction, of permeant as a function of its activity in solution. This is in contrast to those authors who choose to scale the driving force in terms of vapor pressure or concentration[17] expressed as mass per unit volume. The present approach utilizes different units in the diffusion equations but does not change the fundamental character of the analysis.

Using this scheme of scaling the permeation driving force in terms of activity, the permeation data of reformulated gasoline containing nearly ideal solutions of ethers is successfully modeled. Therefore an estimate of ether permeation rate from a blended fuel can be made. By contrast, a large excess permeation is observed for non ideal fuel blends containing dilute alcohols. This excess permeation is related to the excess absorption observed for these systems. In this reviewer's opinion, current linear permeation theory is not able to account for this excess permeation and component contribution of alcohol permeation from gasohol cannot be estimated. If the mass flow of alcohol by permeation through materials is desired, then it must be measured directly and these measurements have not been reported.

Several very nice summaries are available which discuss the morphological parameters that affect permeation through materials. [10 18] Important considerations include: permeant concentration (activity), size and shape and flexibility of the permeant, temperature, permeant/polymer chemistry, thickness and crystallinity and void content in the membrane, polymer chain stiffness and interchain interaction. Plasticizer content, if any, is also very influential.[19]

Linear Permeation Theory--Fick's Law

Whenever a flow pathway through a material is narrow relative to the mean free path of the solute, then molecular flow will govern. Molecular flow often occurs in vacuum systems and is the dominant mechanism of solvent permeation in polymers. It is a gradient in chemical activity, $\mathbf{a}_i$, which drives diffusion into and permeation through a membrane. As discussed above, the activity of a liquid component $\mathbf{a}_i$ may or may not be equal to its volume fraction in solution. For ideal solutions, the concentration of a solvent is often substituted for activity.

The isothermal mass flow rate, $\mathbf{Q}_m$, of a liquid solvent through a membrane is driven by the activity gradient according to the following equation:[20]

$$\mathbf{Q}_m = \Gamma\left(\frac{\mathbf{RT}}{\mathbf{M}}\right)^{1/2} \mathbf{S}_i \frac{(\mathbf{a}_1 - \mathbf{a}_2)}{\mathbf{L}} \qquad \mathbf{4}$$

where, Γ is a geometrical constant, $\mathbf{R}$ is the ideal gas constant, and $\mathbf{T}$ is the absolute temperature. The mass flow rate of liquid $\mathbf{Q}_m$ is inversely proportional to the molecular mass $\mathbf{M}$ of the solvent and the thickness $\mathbf{L}$ of the membrane. Since the solvent molecules do not contact one another, there is no viscous dissipation in molecular flow.

Equation 4 is commonly simplified via dimensional analysis by introducing a lumped constant known as the permeability coefficient, $\mathcal{P}$. Assume that the solvent activity is constant on one side and zero on the other side of a membrane. The steady state value of mass transport now becomes:

$$\mathbf{Q}_i = \mathcal{P}\, \mathbf{S}_i\ \mathbf{a}_i \frac{\mathbf{A}}{\mathbf{L}} \qquad \mathbf{5}$$

where **A** is the cross sectional area of a membrane. $\mathbf{S_i}$ $\mathbf{a_i}$ is the concentration of solvent in the material at fractional activity. If a pure solvent is considered, $\mathbf{a_i}$ is unity. $\mathcal{P}$ will have unique values for any given polymer-solvent system and will vary with temperature. Once $\mathcal{P}$ is known, the steady state mass flow of a diffusing solvent may be computed for a given solvent activity drop and membrane geometry.

Multiplying both sides of the above equation by thickness, **L**, utilizing **Equation 3,** and differentiating concentration with respect to distance through the membrane, the familiar form of Fick's first law for steady state permeation emerges:

$$\mathcal{P} = -\mathcal{D} * \frac{dC}{dx} \qquad 6$$

Another material constant, diffusivity $\mathcal{D}$ is expressed as the square of the membrane thickness divided by a characteristic time. To examine the unsteady diffusion behavior, allow $\mathbf{C_i}$ to represent the concentration of solvent as a function of time **t** and position **x** through the membrane thickness. Differentiating **Equation 6** with respect to time, the one-dimensional unsteady differential form of Fick's second law is expressed as follows:[9]

$$\frac{\partial C(x,t)}{\partial t} = \mathcal{D} \frac{\partial^2 C(x,t)}{\partial x^2} \qquad 7$$

To analyze unsteady diffusion behavior, Fick's second law may be solved for various cases of solvent diffusion in materials.

Example 1: Absorption into an Immersed Slab (swelling):[21]

In the study of absorption kinetics, one requires an expression for the amount of solvent which has been absorbed into a material after a given time. Choose an infinite area slab geometry with a solvent free initial condition. Further choose boundary conditions for solvent concentration at both surfaces a constant value of $\mathbf{C_1}$. This condition implies that the slab is immersed in solvent. We wish to measure the amount of solvent absorbed as a function of time. Integration of **Equation 7** gives the concentration profile across the sample thickness as a function of time. This function is an infinite series as shown below.

$$C(x,t) = \left(\frac{4Co}{P}\right)\sum_{m=1}^{\infty}\frac{1}{(2m+1)} \sin\left[(2m+1)\frac{\Pi x}{L}\right] \exp\left[-\mathcal{D}(2m+1)^2\frac{\Pi^2 t}{L^2}\right] \qquad 8$$

Integration of **Equation 8** with respect to position yields the total volume fraction absorbed, V, in a slab as a function of time. This function is also an infinite series where approximately five terms are required for an adequate estimate.

$$\frac{(V(t) - V_0)}{V_\infty} = 1 - \frac{8}{\Pi^2}\sum_{m=1}^{\infty}\frac{1}{(2m+1)} \quad \exp[- (2m+1)^2(\frac{\Pi}{L})^2 \mathcal{D}\, t] \tag{9}$$

Concentration values can be converted to mass or volume changes by using appropriate conversion factors. The unsteady absorption behavior of **Equation 9** is plotted schematically in **Figure 3.** This figure teaches that, for a slab of unit thickness, time t of magnitude $0.28/\mathcal{D}$ is required to achieve 95 percent of the equilibrium absorption. Diffusivity is known to range over several orders of magnitude among materials: elastomers generally exhibit the highest values while thermoset materials typically exhibit the lowest values. Therefore, experimental requirements for measuring absorption of solvents in different materials is expected to vary considerably. This means that a period of years may be necessary to achieve and measure steady state permeation in composite material. One way to accelerate the permeation measurement is to use thinner materials in experiment.

A useful simplification of **Equation 9** may be used for materials which exhibit a low diffusivity. At short immersion time, it may be simplified to the following approximation:

$$\frac{V(t)}{V_\infty} = 4\mathcal{D}^{1/2}\frac{t^{1/2}}{\Pi^{1/2}L} \tag{10}$$

Therefore a plot of $V(t) / V_\infty$ versus $t^{1/2}/ L$ will yield a straight line in the initial absorption region. The slope of this line is proportional to $\mathcal{D}$.

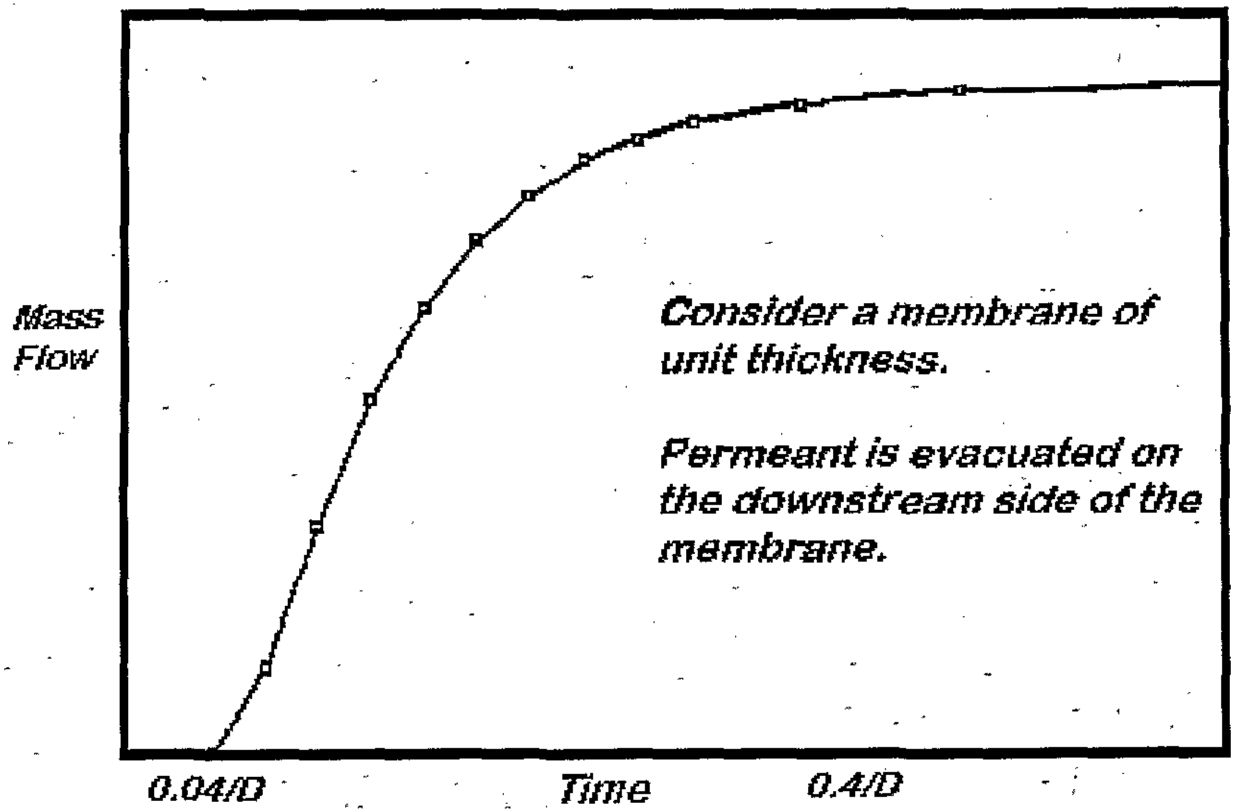
Example 2: Mass Flow through a Membrane (permeation):[22]

If one is measuring the rate of flow of a solvent through a membrane, or permeation, there will be an interval of time from the moment the solvent comes into contact with the membrane until it emerges on the other side. Further time will be required to achieve steady state mass flux. For ease of analysis, choose an infinite slab geometry with a solvent free initial condition. Further choose boundary conditions for solvent concentration at the inside surface as a constant value of $\mathbf{C_1}$ and the concentration of solvent at the outside surface as a constant value of zero. The latter boundary condition implies that mass transport is diffusion limited or, equivalently, the solvent permeates the external environment much faster than the membrane. As such, accumulation of permeant in a boundary volume located on the outside surface of the membrane is negligible.

As measured at the outside surface, the total mass flow through the membrane increases with time to a steady state value. The solution of **Equation 5** under these conditions is also an infinite series where approximately five terms are required for an adequate estimate.

$$Q_m = \mathcal{D}\, S\, a_i \frac{A}{L}\left[1+2\sum_{n=0}^{\infty} \cos(n\pi)*\exp(-(\frac{n\pi}{L})^2 \mathcal{D}\, t)\right] \tag{11}$$

Figure 3 Schematic representation of unsteady mass flow by Case 1 diffusion of a permeant through a membrane



As the concentration gradient reaches a steady state value, the mass flow rate through a membrane is constant and **Equation 11** reduces to **Equation 5.** The interested reader may also note that **Equation 11** is actually the derivative of a more common expression used to describe permeation through a membrane where the permeant concentration is allowed to build-up on the downstream surface. **Equation 11** is valid for the present case where the permeant is continually removed from the outer surface.

Figure 3 teaches that, for a membrane of unit thickness, an onset time of approximately ($0.04/\mathcal{D}$) is required to measure the first one percent of the steady state mass flow of molecules which permeate through a membrane. About an order of magnitude more than the onset time is required to measure steady-state mass flux. Diffusivity is known to range over several orders of magnitude among polymers: elastomers generally exhibit the highest values while thermoset materials typically exhibit the lowest values. Therefore, experimental requirements for measuring permeability in these different materials is expected to vary considerably.

In summary, mass flow by permeation is proportional to the product of diffusivity, solubility and the activity of a solvent molecule. The diffusivity depends upon the inverse square root of the molecular mass of the diffusing solvent whereas the solubility depends upon a binary interaction parameter that is related to the enthalpy of mixing of polymer and solvent. Therefore a high permeability may be observed with either small, volatile solvents or with solvents that strongly associate with the matrix material or both.

6.1.3 Plasticization and Extraction

Diffusion of solvents in and through polymers is generally accompanied by a change in properties of the material. In addition to the change in physical dimensions associated with swelling, mechanical properties such as strength and stiffness are usually affected. As little as 20 percent volume swell can reduce physical properties such as hardness, strength, and tear resistance of an elastomer by 60 percent.[23] Twenty percent by volume swelling is generally considered a conservative upper limit for solvent absorption by an elastomer in a sealing application.[24] Solvent absorption is also of critical importance to thermoplastic and thermoset materials. Although these materials typically absorb much less solvent, substantial changes in mechanical properties and a reduction of upper-use temperature are also observed.

Underground Storage Tank Membranes:

Perhaps the most critical application where plasticization of a material by solvent ingress is important to consider is the underground storage tank (UST). Since an UST is buried, it will be subjected to combined compressive loads from the soil, the water table and the live loading. To resist global buckling, composite UST's are equipped with circumferential stiffening rings.[25] As such, UST design incorporates large factors of safety against global buckling. The limiting design criteria for UST's is local elastic buckling of the membrane between the ribs.

Buckling formulas for cylinders under external loading show the importance of the stiffness of the membrane, E. If an *unsupported* thin-walled tube containing stiffening rings is subjected to external pressure, then the formula for critical buckling load, P_c, is proportional to the stiffness of the membrane according to the following form.[26 27]

$$P_c = 2Et/D(n^2-1)(1+k) + 8EI\left[\frac{n^2-1+2n^2-1-\nu_{hl}}{(1+k)D^3(1-\nu_{hl}\nu_{lh})}\right] \qquad 12$$

where "t" and "D" are the thickness of the membrane and the diameter of the tube, "L" is the distance between stiffening rings, "ν" is Poisson's ratio of the material and "k" is a dimensional constant equal to $2nL/\pi D$. Notice that the only material property of consequence (other than ν) is the stiffness of the material "E." Strength of the material is unimportant to buckling analysis. Thus any drop in membrane stiffness will result in the same percentage drop in the local buckling *resistance of the shell according to this equation.*

If the cylinder is buried, additional support may be afforded by the soil. A modified Luscher formula has been proposed[28] to describe the local buckling resistance of a ribbed cylinder under uniform soil support. This empirical function is written as follows:

$$FS * P_c = (32R_wB'E'E.I/D^3)^{1/2} \qquad 13$$

Where "E" is the soil modulus, "B" is Luscher's coefficient of elastic support and "R_w" is an empirical constant. "FS" is a safety factor. In **Equation 13**, the soil is assumed to contribute significantly to the local buckling resistance of the tank. Because of uniform soil support, any decrease in laminate stiffness has a square root effect on the critical buckling load of the laminate.

It is for this reason, that fiberglass UST vendors emphasize the importance of good installation practices.[29] Well compacted back-fill is required to provide maximum soil stiffness and uniform soil support of the membrane. This is especially important because deformations associated with localized buckling are much smaller than those associated with global buckling. If uniform, compacted soil is not provided, either by installation or service considerations, then the behavior of the critical buckling load with laminate stiffness may actually lie somewhere in between the functions described empirically by **Equations 12 and 13.**

Thus, for sound design, a safety factor in **Equation 13** is utilized. The safety factor is proposed to be 2.5 and it incorporates at least five elements including, creep, environmental effects, as well as other uncertainties such as soil support variations. The allowance for reduction of stiffness due to plasticization by environmental exposure is about 12 percent. This is presumably based upon Owens Corning's experience with plasticization of isophthalic polyester laminates by gasoline and water environments. After more than ten years exposure, the laminate has been shown to retain more than 80 percent of its original stiffness.[30] Since $(1/0.8)^{1/2}$ is about 1.12, an allowance of 12 percent modulus drop in the composite is allowed in this formulation.

Extraction of Plasticizers:

The inverse phenomenon of plasticization by solvent ingress is the migration of plasticizers and other additives out of polymers. Additives such as antioxidants, heat stabilizers, processing aids and plasticizers, etc. are commonly added to polymeric materials in order to achieve a certain property set. These additives are generally not covalently bonded to the polymer and are able to migrate. If a material containing additives comes in contact with a solvent, the additives may be extracted by the solvent.[31 32 33 34] If the solvent is not refreshed, the degree of extraction will depend on a partition coefficient for the solvent-polymer pair. If the solvent is refreshed, plasticizer extraction can be complete.

Extractable plasticizers are generally low molecular weight phthalate esters and are most commonly used in elastomers such as NBR and flexible thermoplastics such as PVC and PA.[35] They are, however, much higher molecular weight than the constituents in oxygenated gasoline. Interestingly, no firm relationship has been established linking the molecular weight of the plasticizer to its rate of permeation.

Often, plasticizer extraction is also accompanied by solvent swelling and the magnitude of these phenomena will mask each other. Often the material will swell through a maximum value then begin to shrink as the plasticizer leaves the host material. This has been described as a solvent exchange process. Therefore the effects of plasticizer extraction may not be observed until the polymer is removed from the solvent allowed dry-out for several hours or days.

Extraction of plasticizers will lead to significant change in properties such as: shrinkage, increasing the brittle-ductile transition temperature of materials. Shrinkage of seal materials can compromise their sealing behavior. MTBE is thought to be capable of extracting solid fillers, such as titanium dioxide as well.[36]

6.1.4 Environmental Stress Cracking (ESC)

Environmental Stress Cracking (ESC) is a term commonly used to describe the combined influence of the thermal-chemical environment and the applied load on crack initiation and propagation mechanisms.

Increasing crystallinity and molecular orientation and decreasing molecular weight of polymers has a tendency to promote ESC.[37] Thus, in some polymer formulations, plasticizers are often added to improve their flexibility and toughness especially at low temperatures. Extraction of these plasticizers by solvent exposure can lead to embrittlement especially at lower temperatures. Rupture of embrittled materials is a form of ESC.

On the other hand, unsteady migration of solvents into polymers will lead to swelling of the surface layers more than the inner layer. In this case, the surface layers are put into compression which is balanced by tensile loads in the non swelled inner layers. If the applied stresses, from differential swelling, external loading or residual stress, is greater than the breaking stress, ESC will occur. This effect may be more pronounced in glassy thermoplastics and thermosets where diffusion into the polymer substrate is more likely to be described by Case II.

Another form of ESC, called explosive decompression, occurs when vapors are condensed inside polymers at high pressure. Rapid release of pressure causes expansion of these vapors. If the vapor pressure is greater than the strength of the material, blistering will occur. Although this type of failure mechanism is common for elastomers, operating pressures at retail gasoline stations and distribution terminals are not high enough to cause this type of failure.

It should be mentioned that ESC is not discussed in the literature as an important failure mechanism for materials exposed to oxygenated fuel environments. Therefore ESC will not be discussed further.

Thermal Effects

Effect of Temperature on Swelling Behavior

As indicated above, equilibrium swelling of materials by mixed solvents is determined by the product of a partition coefficient and the activity of the swelling species. Therefore, the swelling behavior will depend on the nature of solvent interaction with other solvent species and with the polymer.

It has been suggested (imbalzano) that increasing temperature increases permeability because both the diffusivity and solubility increase with temperature. If there are no interactions among polymer and solvent molecules, this is expected to be true.

If there are exothermic interactions among polymer and/or solvent molecules, then increasing temperature will tend to shift the equilibrium away from formation associated species in favor of the non-associated species. The resulting swelling behavior with temperature will depend on the relative magnitude of the partition coefficients. For example, if high swelling observed at ambient temperature is a result of strong partitioning of associated species, than increasing temperature will tend to dissociate these species and the observed swell will decrease. This phenomenon has been observed for the swelling of fluoroelastomers in MeOH. On the other hand, if low swelling observed at ambient temperature is a result of strong interaction of the polymer with itself, then increasing temperature will tend to break these associations and swelling of the observed swell will increase as indicated above.

Effect of Temperature on Permeation

Permeation of solvents through polymers has been shown to be a thermally activated process.[38] Therefore an Arrhenius form may be adopted to correlate the observed mass flow increase with temperature as suggested below:

$$\frac{Q_T}{Q_{T0}} = \exp\{\mathcal{E}/R\,(\frac{1}{T}-\frac{1}{T_0})\} \qquad 14$$

where $\mathcal{E}$ is a lumped constant. In essence, $\mathcal{E}$ is the sum of an activation energy for viscous flow and a binary interaction parameter associated with solvent absorption as discussed above. Therefore, effect of temperature on permeation rate will depend on the relative changes in these two energies. However it is common to observe permeability increase with temperature, especially when no interaction exists among polymer and solvent species.

For example, consider methane permeating through PTFE near ambient temperature.[39] The value of $\mathcal{E}/\mathbf{R}$ is observed to be approximately 3300 °K. This value implies that permeation rate approximately doubles over a 17 °C increase in temperature.

A similar result was observed for the permeation of oxygenated fuels in elastomers. The permeation rates doubled every 10 to 15 °C.[40]

Effect of Temperature on Elastomeric Seals

At low temperature, elastomers undergo a physical transition called the glass transition temperature. Below its glass transition temperature, an elastomer behaves more like a rigid plastic. An elastomer begins to lose its ability to form a seal at temperatures slightly above its glass transition temperature. This low temperature limit for sealing is often reported in a standard test as TR-10 temperature. TR-10 is the temperature below which an elastomer exhibits less than ten percent retraction.

Most elastomers are formulated to have TR-10 values below -30 °C. However, more recent compounds have been formulated for increased fluid resistance. For example, elastomers have high fluorine content, in the case of fluoroelastomers, or high acrylonitrile content, in the case of NBRs. Increased fluid resistance often compromises low temperature sealing characteristics. [41] Sometimes plasticizers are added to highly fluid resistant elastomers to retain the low temperature sealing properties.

Pressure Effects

As mentioned above, the operating pressures are very low. Also, all solvents are condensed liquids over the applicable range of operating temperatures and pressures. As such, the total pressure will not have any appreciable influence on activity coefficients of the solvents. Thus, pressure is not expected to exhibit an observable effect on the absorption and mass flow of solvents in and through polymers.

Effect of Time

As mentioned above, the diffusion coefficient is observed to vary over several orders of magnitude. Therefore the time required to reach equilibrium absorption or steady state permeation is also expected to depend strongly on the type of material in question and the thickness of the part. For example, fluorocarbon based elastomers[42 43] and thermoplastics are known to require much more time to reach equilibrium absorption than hydrocarbon based polymers require. One study reported 12 months were required for the swelling and extraction phenomenon to stabilize in some elastomers.[44] As a result, the diffusivity and permeability of fluorocarbon based materials to solvents is correspondingly lower.

6.1.5 Testing Standards for Nonmetallic Materials

Fuel Stability

Two ASTM procedures test gasoline for gums and oxidative stability.[45 46] The purpose of these tests are to determine the quantity of oxidation products formed in a sample and or the propensity of a fuel to oxidize and form these gums. The results of these tests can be used to indicate the storage stability , due to oxidation, of the fuels.

Compatibility Testing

ASTM [47] defines non-oxygenated standard reference fuels for compatibility testing. Although gasoline is a complex blend of aliphatic, olefinic and aromatic hydrocarbons, test fuels are bicomponent mixtures of isooctane and toluene. Fuels A, B, C, D, and E contain a 0, 30, 50, 60 and 100 percent by volume toluene, respectively in isooctane. Since modern unleaded gasoline usually contains between 30 and 50 percent by volume aromatics, most observers use Fuel C in their testing. Aromatic hydrocarbons are known to be more aggressive than aliphatic or olefinic hydrocarbons, so the use of Fuel C is thought to be a representative but conservative choice.

Standard methanol fuels are defined by SAE.[48] Reference Fuel C is the base fuel to which various concentrations of reagent grade methanol is added. For elastomers the abbreviations CM0, CM15, CM30, CM50, CM85 refer to zero to 85 percent methanol in the reference fuel. For plastics and metals, aggressive methanol is defined according to the following recipe: add 0.005g NaCl, 0.05ml formic acid, and 0.1% H20 (metals only) per liter of methanol. This aggressive methanol mixture is added to Fuel C in the above proportions. For auto-oxidized test fuel: 6.8ml of 70% t-butyl hydroperoxide per liter of fuel C is added along with 0.01mg cuprous sulfate per liter. The standard recommends performing tests in all fuels to determine the worst case. Then do additional testing in the worst case fuel. Similar procedures can be established for other oxygenates such as ethers and other alcohols.

ASTM provides applicable standards for testing the resistance of rubber[49] and plastic[50] to chemical reagents. Little guidance is given on establishing equilibrium conditions, however an interesting discussion is given in the latter standard on the combined action of stress and chemical exposure.

ASTM C 581 is a general standard for chemical resistance testing of composite materials. [51] Immerse samples for 30, 60, 90, 180 and 365 days in a media at a specified temperature. Note color, weight, thickness. Measure change in these properties and also changes in flexural strength and stiffness. Often the rate of change of properties with time is more significant than the absolute value of the property. It is desirable to obtain constant value stiffness, strength, dimensions and weight after a period of time.. This establishes that equilibrium conditions have been established. Appearance: absence of cracks, crazes, loss of gloss, blistering etching, pitting, softening. Discoloration of immersion media or accumulation of sediment. The sample should appear absent of cracks, crazes, loss of gloss, blistering etching, pitting, softening. Discoloration of immersion media or accumulation of sediment is also undesirable.

ASTM D 4021 is a standard which specifically addresses glass-fiber reinforced polyester USTs. [52] It suggests chemical resistance testing which is representative of the fluids to be contained inside the tank, which include: ASTM Reference Fuel C, commercial unleaded premium gasoline, unleaded gasoline, ethyl alcohol 90 percent to 10 percent by volume blended gasohol, and No. 2 fuel oil. Recognizing that water could be inside the tank, testing with distilled water, sodium carbonate-sodium bicarbonate solution at pH=10, potassium biphthalate buffer at pH=4 are also recommended. Further testing with the actual liquid to be contained in the tank, if different than any of the above, is recommended. Interestingly, other than the prior requirement, there is no specific requirement for MTBE compatibility testing as there is for alcohols. Testing conditions: ambient temperature, immersion times of 1, 3, 6, 12 months are recommended. Accelerated testing at 100 °F is suggested, immersion times of 1, 3, and 6 months or longer are required at this temperature if the data are inconclusive. Evaluation of the materials after exposure by conducting mechanical property testing consisting of flexural strength and stiffness, hardness, as well as a visual inspection of the sample and media. Plot property retention versus time on a log-log plot and extrapolate to 100,000 hours (11.4 years). No guidance is given regarding minimum property retention.

UL-1316 is a similar standard for fiberglass USTs which is more often cited than the above ASTM standard. [53] Like the ASTM standard, coupons are immersed in liquids for 30, 90, and 180 days at 100 °F. They are then subjected to flex strength and stiffness testing as well as izod impact toughness testing. There are two types of fluids to be tested. Type A fluids include: leaded and unleaded gasoline, reference Fuel C, No. 2 and No. 6 fuel oils, saturated sodium chloride, and sulfuric acid. Additional liquids for alcohol products include Reference Fuel C with 10, 15, 30, 50, 70, and 100 percent by volume ethanol, and 15, 50, and 100 percent by volume methanol. Greater than 50 percent property retention is required for coupons exposed to these media. Type B fluids include: toluene, deionized water, five percent hydrochloric acid, five percent nitric acid, sodium carbonate-bicarbonate buffer at pH=10, sodium hydroxide at pH=12. Greater than 30 percent property retention is required for coupons exposed to these media. As with the above ASTM standard, there is no specific requirement of MTBE compatibility testing.

UL-971 discusses requirements for nonmetallic underground piping. [54] This standard requires compatibility testing similar to the tank standards as well as permeability testing. With regard to chemical compatibility, immersion testing of coupons for 30, 90, 180, and 270 days at 100 °F is required. Measure retention of crush strength, tensile strength, and adhesive shear strength. Here, four types of fluids are specified for testing: Type A and Type B, and internal and external fluids. Greater than 50 percent retention of properties is required for type A fluids and greater than 30 percent retention of properties is required for type B fluids. This is required for both primary and secondary piping. Type A internal fluids include: leaded and unleaded gasoline, reference Fuel C, No. 2 and No. 6 fuel oils. Additional liquids for alcohol products include Fuel C with 10, 15, 30, 50 percent by volume ethanol, as well as 15 and 50 percent by volume methanol. Type A external fluids include: sulfuric acid at pH=3, and saturated sodium chloride. The type B internal fluid is toluene. Type B external fluids include: deionized water, one percent hydrochloric acid, one percent nitric acid, sodium carbonate-bicarbonate buffer at pH=10, and sodium hydroxide at pH=12.

UL-567 discusses requirements for construction and performance of piping connectors.[55] Leakage tests are to be conducted at 1.5 times the rated pressure and at the minimum bending radius of the connector. It also specifies swelling and extractable limits for rubber parts (seals) in contact with the media. After 70 hours at ambient temperature, the volume swell shall not exceed 25 percent (or 40 percent in reference Fuel C and its blends). Extractables are to be limited to ten percent by weight and not more than a one percent shrinkage of the material. If these dimensional stability limits are exceeded, additional proof testing is required. To preclude galvanic action, this standard prohibits direct metal-to-metal contact between copper, or a copper alloy, and aluminum.

Permeability Testing

Several testing standards have been established for testing nonmetallic materials permeability and compatibility in oxygenated fuel blends.

In addition to the above chemical compatibility testing, permeability tests are required for underground piping in UL-971. This test is performed by taking 18 inches of the smallest diameter pipe, filling with liquid and then sealing it. Samples are weighed every month for 180 days. Permeance is computed every month and the maximum weight loss rate allowed is 4 g/m^2/day (0.013 oz/ft^2/day) for the primary conductor and 24 g/m^2/day on the secondary pipe. Area basis is the inside area of the pipe. This permeation requirement is a standard based upon safety, not an environmental standard. Permeation test liquids are: unleaded premium gasoline, unleaded regular gasoline, Reference Fuel C and No. 2 fuel oil and toluene. For alcohol fuels, 100 percent methanol and ethanol as well as blends containing 10, 30, and 50 percent by volume blends of the same with Fuel C. Additionally, 10 and 30 percent by volume blends are required for ethanol. Again no specific requirement for permeability testing in MTBE solutions is mentioned.

ASTM standards for permeation of plastics are intended for the food packaging industry and , as such, focus on oxygen[56] and other gas[57] transport rather than hydrocarbons. However these standards do stress the requirement to achieve steady state permeation.

A procedure for determining permeation resistance of elastomeric tubing is SAE J1737.[58] This procedure specifies a reservoir to supply gasoline to the hose. In this way, speciation caused by rapid permeation of dilute components present in the fuel is thought to be minimized. The units of mass flow are expressed in terms of gm/m^2/day. This number is called Permeance. Permeance multiplied by the thickness of the membrane is called the permeability coefficient (example: gm*mm/m^2/day).

SAE J2260 sets minimum requirements for multilayer tubing for gasoline and alcohol blends. Permeability performance is measured at 60 °C.[59] **Table 4** summarizes the performance criteria as specified in the standard:

Table 4 - Performance ranking system for elastomeric hoses based upon permeability to fuels (from SAE J2260).

Performance Category Number	Permeation Range (gm/m2/day)	Suggested Time for Testing (hr)
1	0-25	over 1000
2	25-50	1000
3	50-100	800
4	100-200	600
5	200-400	500
6	over 400	400

SAE J30[60] specifies wall thickness standards for flexible hoses as follows: wall thickness for hoses is as follows: up to 1/4 nominal, 0.76mm (0.030"); greater than 1/4 to 7/8 nominal, 1.02 mm (0.04"); greater than 7/8, 1.27 mm (0.050"). For a permeation test, it specifies the reservoir method where the length of the hose is 300 mm. The reservoir size equals 460 to 490 ml but only filled to 300 ml. The assembly is weighed every day for an unspecified period. Agitate the fuel daily. Calculate gm/m^2/24hr on a daily basis. Also a cold flexibility test is given as follows: Samples are conditioned at -40°C for five hours. Flex the hose through 180 degrees bend at a radius equal to ten times the hose diameter. Flexing cycles are to occur within four seconds and the hose must not show any signs of cracking. A proof pressure of 99 psi may be applied. Also, the composition of hoses are described as follows: R7 is as NBR/PVC blend liner with a CSPE cover, R8 is a CO liner with a CO cover and R9 is an FKM lined hose with an NBR/PVC blend outer cover.

6.2 Metals

Many general texts can be consulted regarding the phenomenon of metal corrosion by aggressive media.[61 62] A concise set of terminology relating to corrosion and corrosion testing is found in the ASTM standards literature[63] along with a recommended practice for statistical analysis of corrosion data.[64]

It is not the intent of the following discussion to teach corrosion concepts; however, a review of some fundamental aspects of the problem, as is associated with oxygenated fuels, is desired. In general, corrosion can manifest as general corrosion or pitting. General corrosion is a uniform attack of the surface and corrosion rate is expressed in terms of loss of thickness or weight per unit of time. Lifetime estimates may be made based upon a corrosion allowance. Pitting corrosion is localized attack appearing as a series of holes in the surface. Under certain conditions, pitting corrosion can bore holes completely through a metal part and cause pinhole leaks. Both types of corrosion can occur simultaneously and the processes which govern pitting corrosion versus general corrosion are very complex.

6.2.2 Dry Corrosion

The corrosive behavior of alcohols has been divided into two major types: dry corrosion and wet corrosion.[65] Dry corrosion refers to the corrosion of metals in the presence of very dry fuel blends. Dry alcohols can react with lead, magnesium and certain aluminum alloys with the formation of alkoxide or alcoholate corrosion products. The alkoxide reaction in the absence of oxygen was described above. The cathodic reduction of ethanol (and presumably methanol) in the presence of oxygen and a metal has also been proposed as follows:[66]

$$\frac{1}{2}\,O2 + C_2H_5OH + 2\text{electrons} \rightarrow OH^- + C_2H_5O^-$$

The two electrons would presumably be supplied by the anodic dissolution of a metal. Aluminum alkoxides have been proposed to decompose to Aluminum oxides and water by the following mechanism:

$$2(C_2H_5O^-)_3Al \rightarrow Al_2O_3 + CH_2{=}CH_2 + H_2O$$

If this mechanism is correct, it implies that ethanol blended gasoline cannot remain dry when in contact with aluminum and other active metals. Water is a corrosion product and therefore hydrated alcohol will result.

Hydrated alcohol contains water levels in the parts per million range. For example, as little as 0.1 to 0.2 percent water can effectively passivate aluminum and ferritic stainless steels and inhibit dry corrosion of materials in neat alcohols. A threshold minimum concentration of water of about 0.25 percent by weight of methanol is required to suppress the corrosion of magnesium by methanol blends.[67]

In addition to chemical reaction, water can get into gasoline from other sources such as absorption from humid air,[68] condensation, etc. Whenever water is present in gasohol, the electrical conductivity of the gasohol solution increases to the extent that new corrosion mechanisms are enabled. For example, mechanisms such as electrolytic and galvanic corrosion have been observed. Galvanic and electrolytic corrosion processes described below are not observed in gasoline which does not contain alcohol. This is because addition of ethers to gasoline does not increase the solubility of water and therefore the conductivity of the hydrocarbon phase.

6.2.2 Galvanic Corrosion

Galvanic corrosion occurs when two dissimilar metals are in electrical contact. When an electrolyte solution wets this junction, an electrical circuit is completed. Whenever the conductivity of the fuel exceeds 40 (Naegeli) to 70[69] microseimens per meter, the electrolyte is of sufficient strength to support galvanic attack as well as electrolytic attack (described below). In a sense, a battery is formed where the more active material is corroded at the cathode. In turn, the less active metal acts as an anode and is protected from corrosion. Galvanic corrosion may occur in the absence of other corrodants such as oxygen.

Galvanic corrosion is of particular concern for existing underground metallic components and for components in the dispenser.[1] Many of these systems were designed only for low conductivity fluids and, as such, galvanic attack was not considered as a failure mechanism. Therefore, there may be many dissimilar metal junctions in existing facilities which may be subject to galvanic attack when storing and dispensing alcohol blended fuels. Of particular concern are bimetallic junctions between aluminum and brass, because there is a large electrochemical potential driving the corrosion of aluminum.[70]

6.2.3 Electrolytic Corrosion

Electrolytic corrosion is dissolution of metal by an impressed electrical current. If an electric potential of greater than approximately one volt exists, stray electric currents can cause corrosion of metal at a very rapid rate. This process will be limited only by the conductivity of the media. Stray electrical currents of up to 40 microamperes have been observed between the fuel pump and the fuel tank of automobiles.[71]

Conventional fuels are not conductive and therefore electrolytic corrosion may not have been a design consideration for some retail gasoline tanks and dispensing equipment. Electrolytic corrosion may be avoided by proper grounding of submerged components such as electric pumps and level gauges.

6.2.4 Wet Corrosion

Depending upon the aromatic content of the fuel, the temperature, the presence of alcohol, and perhaps other factors, water content above 0.1 (MeOH blends) to 0.5 (EtOH blends) percent in gasohol will cause phase separation of the fuel blend.[72] Water is essentially insoluble in gasoline which does not contain alcohol and phase separation occurs at very low levels of water. Many UST's have an aqueous layer in the bottom of the tank. Wet corrosion occurs in this lower aqueous phase.

Due to a favorable exothermic interaction with water, the alcohol preferentially partitions into the aqueous phase and depletes the alcohol content in the gasoline. The aqueous phase becomes saturated with alcohol and ionic contaminants. The hydrocarbon phase in equilibrium with the aqueous phase is hydrated gasohol. In contrast, ethers are soluble in water only to approximately five percent at ambient temperature[73] and non-polar hydrocarbons are essentially insoluble in water.

In the lower, aqueous phase, reactions involving oxygen are more pronounced because the solubility of oxygen is greater in the aqueous phase than in the hydrocarbon phase. Familiar corrosion reactions may be written schematically in the following manner ("x" and "y" refer to unspecified molar quantities):

$$xM + yH_2O \rightarrow M_xO_y + yH_2$$
$$xM + 1/2y\, O_2 \rightarrow M_xO_y$$
$$M_xO_y + H_2O \rightarrow M_x(OH)_y + OH^-$$

These corrosion reactions are possible in the upper, hydrated alcohol hydrocarbon phase because the presence of alcohols and water greatly increases the conductivity of the hydrocarbon phase.

The rate of these corrosion reactions is affected by the presence of ionic contaminants such as salts and other corrosion products. Ionic species increase the conductivity of the media thereby speeding the electrochemical processes at the anode and the cathode. They also may play a direct role in defining the corrosion mechanisms as is discussed below.

6.2.5 Multiphase Corrosion

Multiphase corrosion refers to the fact that a material exposed to both wet and dry conditions are exposed to all of the above corrosion mechanisms.

6.2.6 Wear

Wear is the deterioration of a surface due to material removal caused by relative motion of it and another part. In corrosive media, wear may be synergistically accelerated by the combined influence of these removal processes. This is related to the erosion corrosion process described above.

Much of the discussion of wear phenomena is associated with upper cylinder wear in internal combustion engines.[74 75 76] This type of wear is associated with the formation of performic acid, or other aggressive species, from the partial oxidation of alcohol in cold engines. This process is not expected to occur in underground storage and dispensing equipment.

However, alcohol and alcohol blends do tend to promote more metal-to-metal wear than gasoline. Ethanol blends tend to provide less lubricity than methanol.[77] Temperature, sliding speed, and water content were found to be important parameters influencing wear rate.[78 79] The largest increase in the wear rate of steel is found just below the water content at which phase separation occurs in alcohol blended gasoline. This phenomenon was attributed to the formation of microdomains of an aqueous phase which has not coalesced

Additives have been found to improve the lubricity of alcohol blended gasoline. However, many of these additives such as corrosion and wear inhibitors have been found to have negative effects on engine performance due to the formation of deposits in and around the combustion chamber.

6.2.7 Erosion-Corrosion

Erosion-corrosion occurs under dynamic fluid flow conditions and under conditions of wear. Under these conditions shear stress at the wall can remove protective corrosion product films from metal surfaces. Corrosion rates are increased due to this process of building protective oxide/hydroxide layers and subsequent wear or washing away. Erosion-corrosion can be enhanced if the flow media is multiphase.

6.2.8 Effect of Contaminates in Solution

In addition to containing small amounts of water, technical and industrial grades of alcohols also contain traces of organic acids, aldehydes, peroxides, ketones and esters and other materials.[80] Trace levels of contamination, such as the sulfate impurities from fermentation processes[81] or chloride ion from salts or pH variation can have a large influence on the observed corrosion mechanisms and therefore the observed corrosion rate. This has been shown systematically in electrochemical corrosion studies of aluminum[82] and iron alloys.[83] Synergistic effects are seen with the chloride ion and it is often thought to be the most aggressive counter ion.[84]

6.2.9 Effect of Alloying Elements

Just as the level and type of contaminants in solution greatly affect corrosion rate, the type and level of alloying elements in metals can affect the rate at which corrosion is observed. This phenomenon is associated with the stability of the oxide layer of the metal surface. For example chromium is added to steel to promote its corrosion resistance. Conversely, pure aluminum forms a stable oxide film and alloying elements can disrupt the stability of this protective barrier. For example, addition of copper to aluminum[85] or steel[86] promotes corrosive attack by alcohols.

6.2.10 Environmental Stress Cracking

Environmental stress cracking (ESC) most often occurs in stainless steels which are in the presence of ionic contaminates such as chloride or sulfide. ESC, however, generally occurs at temperatures above 140 °F and is not mentioned as an important failure mechanism in this literature. Therefore it will not be considered further.

6.2.11 Thermal Effects

Temperature has very complex influence on the corrosion process. On one hand, all the aforementioned reactions are accelerated with temperature. On the other, the solubility of certain corrodants like oxygen decrease with temperature.

For example the corrosion rate of steel in hydrated alcohols is observed to increase exponentially with temperature in the range of 20 to 80 °C, from 0.04 to 0.14 g/m2/h. The corrosion rate of aluminum also increases with temperature. In contrast, the corrosion rate of copper goes through a maximum with temperature at approximately 50 °C. In the range of 20 to 80 °C, the corrosion rate is less than 0.01 at the extreme temperatures and 0.023 g/m2/h at 50 °C.[87]

6.2.12 Effect of Time, Corrosion Inhibitor

The corrosion rate of metals may decrease with time if a stable, passive oxide film is formed. However, for steel immersed in ethanol blended fuels, electrochemical measurements have shown that the corrosion rate may either increase or decrease with time, depending upon the choice of corrosion inhibitor.[88] Inhibitors investigated include mono-, di- and tri-ethanolamines, with the smaller molecular weight inhibitors performing best. Another study found amine-based corrosion inhibitors are also effective for steel.[89]

6.2.13 Testing Standards for Metallic Materials

There are many standards for evaluation of metal corrosion and/or wear phenomena. In addition to the nomenclature and statistical analysis standards mentioned above, there are several additional standards for evaluating corrosion. A few of the ASTM Standards will be briefly summarized in this section.

ASTM G-1 is a standard practice for preparing, cleaning, and evaluating corrosion test specimens[90]. It covers suggested procedures for preparing bare, solid metal specimens for tests, for removing corrosion products after the test has been completed, and for evaluating the corrosion damage that has occurred. Emphasis is placed on procedures related to the evaluation of corrosion by mass loss and pitting measurements.

ASTM G-31 - 95 is a standard for conducting laboratory immersion corrosion tests.[91] This practice describes accepted procedures for and factors that influence laboratory immersion corrosion tests, particularly general mass loss tests. These factors include specimen preparation, apparatus, test conditions, methods of cleaning specimens, evaluation of results, and calculation and reporting of corrosion rates. This practice also provides a checklist for reporting of test data.

ASTM G-46 - 94 is a standard for examination and evaluation of pitting corrosion.[92] It is intended to assist in the selection of procedures that can be used in the identification and examination of pits and in the evaluation of pitting corrosion to determine the extent of its effect.

ASTM G-71 - 81 is a guide for conducting and evaluating galvanic corrosion tests[93] to characterize the behavior of two dissimilar metals in electrical contact in an electrolyte under low flow conditions. It can be adapted to wrought or cast metals and alloys. The guide covers the selection of materials, specimen preparation, method of exposure, and method for evaluating results to characterize the behavior of a galvanic couple.

ASTM G-119 - 93 is a guide for determining the synergism between wear and corrosion.[94] It provides a guide for computing the increased wear loss rate attributed to synergism or interaction that may occur in a system when both wear and corrosion processes coexist. The guide applies to systems in liquid solutions or slurries and does not include processes in a gas/solid system. The guide applies to metallic materials and can be used in a generic sense with a number of wear/corrosion tests. It is not restricted for use with approved ASTM test methods.

ASTM G-133 - 95 is a standard test for evaluating wear using a linearly reciprocating ball-on-flat sliding test.[95] It describes laboratory procedures for determining the sliding wear of ceramics, metals, and other candidate wear resistant materials. The direction of the relative motion between sliding surfaces reverses in a periodic fashion such that the sliding occurs back and forth and in a straight line. The principal quantities of interest are the wear volumes of the contacting ball and flat specimen materials; however, the coefficient of kinetic friction may also be measured using the method described. This method encompasses both unlubricated and lubricated testing procedures. The scope of the method does not include testing in corrosive or chemically aggressive environments.

7.0 Results and Discussion

7.1 Non-Metals

As literature data are used to evaluate swelling and permeability of materials, be aware of certain complications associated with precise reporting of this behavior. When an aggressive solvent is present in dilute quantities, selective absorption into materials may deplete its concentration in solution. Also, some materials contain extractable materials and last, equilibrium swelling and permeation should always be verified. All of these effects can create an apparent absorption and permeation in materials which is less than the actual value. Absorption error tends to be more pronounced for lower swelling systems and permeability error tends to be more pronounced for higher permeating materials.

7.1.1 General Observations on the Effects of Model Fuel Blends on Polymeric Materials:

Tables A1 through **A6** in **Appendix A** summarize swelling data from the literature while **Tables B1** through **B6** in **Appendix B** summarize permeability data. These data are categorized by solution and by specific material. Standardized nomenclature is used to refer to generic elastomer[96] and thermoplastic[97] materials. A description of some common fuel-handling elastomers is offered in **Appendix C**.[98]

Data for composites, which compose rigid piping and USTs, and to a lesser extent thermoplastic materials, which compose flexible piping and sumps, are noticeably sparse. This lack of data is a primary result of the automotive industry reporting most of the data on materials compatibility and permeability. Composite materials are not used in automotive fuel systems.

Aside from the apparent variability of experimental observations in the data that do exist, some trends are widely observed. For example, increasing the ether content in reformulated gasoline generally increases the swelling response of elastomers monotonically.[99] [100] [101] This swelling behavior has been shown to scale linearly with the activity of the aggressive swelling agent in solution. By contrast, increasing alcohol content in gasohol generally produces a maximum swelling response in polymers.[102] [103] [104] [105] This maximum is located at approximately 15 percent EtOH by volume and somewhat higher for MeOH. Generally, an alcohol fuel blend is more aggressive toward polymers than any of the neat constituents in the fuel. This result is related to the nonideal solution thermodynamics of gasohol solutions as discussed above.

Another general observation is that increasing the fluorine content in fluoroelastomers generally improves its resistance to swelling and permeation by oxygenated hydrocarbons.[106] The reason for this can be found by studying the molecular structure of the FKM elastomer. FKM-66 is a copolymer of vinylidene fluoride and hexafluoropropylene. Hertz[107] explains that the vinylidene fluoride monomer preferentially polymerized in a head-to-tail fashion. As such there are alternating $-CF_2-CH_2-$ moieties on the elastomer backbone. The electron withdrawing character of the fluorine atom causes the hydrogen atoms to become acidic. Thus, exothermic interaction occurs among the polymer chains and excellent resistance to hydrocarbons, including aromatic hydrocarbons is observed. However, when hydrocarbons with Lewis base sites, like many ethers and alcohols, are introduced to FKM, these intra-molecular forces are broken by enthalpy favored interaction with the solvent. Considerable elastomer swelling results. FKM elastomers with higher fluorine content achieve this composition by replacing some of the vinylidene fluoride monomer with tetrafluoroethylene monomer. The resulting terpolymer has fewer acid-base sites and therefore is swelled to a lesser extent by alcohols and ethers.

The swelling response of FKM elastomers, as a function of MTBE concentration in gasoline, as well as temperature and fluorine content, were correlated using a statistical model.[108] [109] It was found that a linear correlation was sufficient to fit the data, no variable interactions were found to be significant. The resulting fit has the following form.

$$Y = \mu + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \qquad \mathbf{15}$$

where μ and β_n are fitting constants for the variables X_n and ε is the estimated error. These equations are very useful for predicting changes in mechanical properties and hardness, etc. with changing fuel composition or temperature. The study found that temperature had the greatest effect on swelling with increased swell observed at higher temperatures. A reduction of properties was also coincidentally observed.

Fluorocarbon plastics offer better resistance to swelling and permeation than other plastics and elastomers.[110] For example, approximately hundreds of times less permeation to Fuel C than PA-11 was observed. The permeation values of fluoroplastics change very little with the addition of either alcohols or ethers to gasoline whereas permeation usually increases for most other thermoplastics.

Increasing acrylonitrile content in NBR improves its resistance to aromatic hydrocarbons[111] as well as its permeability to gasoline.[112] Higher acrylonitrile content in NBR has a lesser beneficial effect on the resistance to ethers and actually reduces the resistance of the elastomer to concentrated ethanol[113] and methanol[114] fuels. Unfortunately, increased acrylonitrile content also generally decreases low temperature flexibility.

Even though swelling and permeability behavior vary markedly among materials of the same class, materials are lumped together in classes such that a range of behavior in each material class is given. This is done for two reasons: The variability among observations from different observers of similar materials is in some cases nearly as significant as the range itself. Second it allows broad categorization by end-use.

7.1.2 Swelling of Polymeric Materials in Model Fuel Blends and Neat Oxygenated Hydrocarbons:

Table 5 summarizes by class the swelling ranges of elastomers and other materials in model ASTM Fuel C blends with and without added oxygenated hydrocarbons. It is observed that, addition of 15 percent MTBE does not significantly change the performance of FKM and NBR elastomers commonly used for seals and hoses, respectively. That is, the swelling of FKM seals remains below 20 percent by volume and the swelling of NBR-based hose materials may actually decrease somewhat. However, addition of 10 to 15 percent by volume of MeOH may compromise the integrity of some components by increased swelling of common elastomers beyond acceptable limits set for certain seal and/or hose applications.

Table 5 - Volume swelling ranges of polymeric materials exposed to model fuels with and without oxygenates.

Materials	*Primary Application*	*Percent Swell by Volume*			
		ASTM Fuel C	*Fuel C + 15 % MTBE*	*Fuel C + 10 to 15 % MeOH*	*Fuel C + 10 to 15 % EtOH*
NBR/Blends	Hose	23 to 56, 28*	19 to 38	49* to 106	22 to 70, 34*
FKM	Seal	1 to 14, 10*	6 to 18*	7 to 46*	6 to 24
FSi	Seal	18 to 21	24	30	19 to 20
CO, ECO		35 to 40		77 to 80	50 to 65
U	Seal	21	24	58	51
CSPE		61		66	81
CIIR		96		81	
CPE				87	
PS	Sealant	27		28	
PA	Pipe Liner	-0.5 to 0.5	-0.5 to 0.2		
Acetal	Molded Parts	1	0		
HDPE	Flexible Pipe	10.7	10.9		
Fiberglass	Rigid Pipe	-0.43	-1.3 to 2.3		
Fiberglass	Tank	-0.02	-0.51	10	

* Behavior of the most common material used in the class.

Table 6 summarizes by class swelling data for common elastomers exposed to neat oxygenated hydrocarbons. It is observed that neat MTBE and neat MeOH are both aggressive swelling agents for FKM whereas they are less aggressive toward NBR-based elastomers. In comparing **Tables 5 and 6,** it is interesting to note that the swelling power of ethers are reduced as they are diluted into the nonpolar gasoline whereas the swelling power of alcohols are not reduced.

Table 6 Volume swelling of polymeric materials exposed to neat oxygenated hydrocarbons.

Materials	*Primary Application*	*Percent Swell by Volume*				
		MTBE	*ETBE*	*TAME*	*MeOH*	*EtOH*
NBR/Blends	Hose	36			14	11
FKM	Seal	59 to 180*	3 to 10, 5*	19 to 84, 70*	16 to 135*	2*
FSi	Seal				5	6
CO, ECO					31	2
U	Seal		8		18	19
CSPE					1	1
CIIR					-4	
CPE					-2	
PS	Sealant				3	

* behavior of the most common material used in the class.

As per **Equation 5,** the absorption characteristics of neat oxygenated hydrocarbons are important indicators for the tendency of solvents to permeate polymer membranes. For example, it is shown that ETBE swells FKM and urethane elastomers far less than MTBE or even TAME. Since TAME is an isomer of ETBE, the stereochemistry of the oxygenated hydrocarbon is shown to play an important role in the swelling and permeation characteristic in FKM. Apparently, having both carbon chains longer than a single atom renders the ether moiety more inert towards interaction with polymeric materials. The ethyl group imparts enough steric hindrance that the Lewis base site is partially shielded from interaction with other Lewis acid sites in FKM elastomers. If this phenomenon is shown to be more generally true in thermoplastics and composite materials, it is an important observation because it suggests a method to reduce permeability by changing the structure of the oxygenate additive. Since no permeability data for ETBE was found; this hypothesis should be verified.

7.1.3 Permeation of Polymeric Materials by Model Fuels Containing No Oxygenates.

Generally elastomers have higher values of permeability coefficients while thermoplastics and thermosets exhibit lower values. To estimate the total mass flow, knowledge of the membrane area and thickness are also required. **Table 7** summarizes typical ranges for geometrical constants assumed for a gasoline retail station.

Table 7 Component geometry for permeation mass flow considerations.

Component	*A (m^2)*	*L(mm)*	*A/L (m^2/mm)*
Hose	2.5 to 5	5.0	0.5 to 1.0
Piping	34 to 50		
Sumps			
Tanks	157 to 234	6.4	24.5 to 36.6

Table 8 summarizes permeability ranges reported for many of the material classes exposed to ASTM Reference Fuel C. Expected mass flux values per station, Q, can be computed for some elastomers and plastics and all seem relatively low except for the NBR hose materials. Here it must be reiterated that the NBR/PVC material most commonly used in that application is better represented by the low end of this range.[115]

Table 8 Permeability, solubility and mass flow properties for various materials exposed to gasoline blends containing no oxygenates.

Material	*Primary Application*	*Permeability (g*mm/m²/d)*	*Solubility (g/mm*m²)*	*Diffusivity (mm²/day)*	*activity*	*A/L (m²/mm)*	*Q (g/d)*	*t = 1/D (d/mm²)*
ASTM FUEL C								
Elastomers								
FKM	Hose liner Seals	1 to 7	8 to 110	0.06 to 0.13	1	1 to 2	1 to 14	8 to 30
NBR/blends	Hose	192* to 1200	230 to 760	0.9 to 1.6	1	0.5 to 1	100* to 1200	0.5 to 1
Thermoplastics								
ETFE	Hose liner	0.01 to 0.18			1	6 to 12	0.06 to 2	
PE	Flexible pipe Sump	36	107	0.1	1	8	12	
PA	Flexible pipe liner	5 to 26	~5 to 5		1			
Thermosets								
Epoxy	Rigid Pipe		~4					
Polyester	Tank		~0.2					

* Base fuel 72 octane.

Laminating a hose with FKM elastomer, such as with SAE J30R9 hoses, is anticipated to greatly reduce the total fugitive emission of hydrocarbons. This type of hose is used in the automotive industry to help meet fugitive emission guidelines for fuel systems in cars. It can be speculated that the majority of the total emission of Fuel C from NBR-based hoses is aromatic hydrocarbons since these are known to swell NBR whereas isooctane does not.[116] Thus NBR selectively absorbs and permeates aromatic hydrocarbons. When lined with FKM elastomer the permeation is reduced because FKM is much more resistant to swelling and permeation of aromatics.

7.1.4 Permeation of Polymeric Materials by Ether Blended Model Fuels:

Table 9 summarizes the available permeation data for reformulated gasoline containing 15 percent by volume MTBE. Comparing **Tables 8 and 9**, notice that FKM elastomers show a marked increase in permeability to reformulated fuel. Evidently FKM elastomer selectively absorbs and permeates MTBE relative to the aromatic and aliphatic hydrocarbons even though MTBE is the minor constituent in reformulated gasoline. Conversely NBR elastomer shows a slight decrease in permeability which is indicative of it being a better barrier to MTBE relative to aromatic hydrocarbons.

Table 9 - Permeability, solubility and mass flow properties for various materials exposed to gasoline blends containing 15 percent v/v MTBE.

ASTM FUEL C + 15 percent volume MTBE								
Material	*Primary Application*	*Permeability ($g*mm/m^2/d$)*	*Solubility ($g/mm*m^2$)*	*Diffusivity (mm^2/day)*	*activity*	*A/L (m^2/mm)*	*Q (g/d)*	*t = 1/D (d/mm^2)*
Elastomers								
FKM	Hose liner Seals	15 to 38	60 to 180	0.21 to 0.25	1	1 to 2	15 to 76	4 to 5
NBR/blends	Hose	176*	190 to 380	0.5 to 1	1	0.5 to 1	88 to 176	1 to 2
Thermoplastics								
ETFE	Hose liner	0.1**			1	6 to 12	0.6 to 1.2	
PE	Flexible pipe Sump		109					
PA	Flexible pipe liner		-5 to 2					
Thermosets								
Epoxy	Rigid Pipe		-13 to 23					
Polyester	Tank		-5					

* Base fuel 72 octane. ** ETBE value = 0.05

An attempt is made to estimate the fraction of the total mass flow in NBR and FKM elastomers which is associated with oxygenate permeation alone. These estimates are made by using the observed permeability with and without MTBE and assuming a linear component contribution to the total hydrocarbon permeability according to the following relationship:

$$\mathbf{P_t} = \Sigma \mathbf{a_i} \, \mathbf{P_i} \qquad 16$$

Where $\mathbf{P_t}$ is the total permeability, $\mathbf{P_i}$ is the permeability of each constituent and $\mathbf{a_i}$ is the activity of each constituent in the fuel. This computation is theoretical and therefore subject to question. However as a first approximation, the approach seems appropriate because all the hydrocarbons in the model fuel exhibit nearly ideal mixing. It has been previously established that the solubility contributes to the permeability scale according to the activity coefficients.

Following this line of reasoning, the intrinsic permeability of MTBE in a gasoline environment is estimated by this technique to be approximately 85 ($g*mm/m^2/day$) for NBR and 206 ($g*mm/m^2/day$) for FKM-66 copolymer, respectively. To calculate the estimated component fugitive emission of MTBE from dispenser hoses we apply **Equation 16** assuming an activity of MTBE of 0.15 and a surface area of 2.5 to 5.0 m^2 and a thickness of 5 millimeters for an NBR hose. Therefore the total fugitive emission of MTBE is estimated to be 6 to 13 g/d/station. Here, mass flow of MTBE in NBR based hoses is low compared to the permeation of total hydrocarbon. Apparently MTBE is a less aggressive swelling and permeation agent for NBR than are aromatic hydrocarbons.

An interesting exercise is to determine the effect of adding an FKM-66 copolymer liner to the inside of the dispenser hose, similar to the SAE 30R9 specification for automobile fuel lines. Permeation of solvents in multilayered structures are additive as conductances,[18] thus:

$$\mathbf{P_t} = \frac{\mathbf{P_1 P_2}}{(\mathbf{P_1} + \mathbf{P_2})} \qquad \mathbf{17}$$

If a five millimeter thick NBR hose is laminated with an FKM liner in the inside half, the total permeability of all the hoses in a typical station can be shown to increase to about 18 g/d MTBE.

Therefore it is expected that laminating a dispenser hose with FKM elastomer will lead to increased MTBE permeation even though the total hydrocarbon permeation will be reduced. This increase is due to the selective absorption and permeation of MTBE by FKM copolymer elastomers. It is interesting to note that FKM-lined SAE30R9 hoses are common in the automotive industry. A thermoplastic liner would be required to reduce the total permeation of MTBE in hoses. Such lined hoses have been developed for automotive flex fuel lines and are common styles for air conditioner hoses and natural gas fuel lines.

To summarize the effects of ethers on polymers, pure MTBE is aggressive to many polymeric materials. However, the effects of MTBE on polymers is not expected to cause performance problems when it is diluted into gasoline at the 15 percent level. The permeability of MTBE through elastomers and thermoplastics is also proportional to its concentration in the gasoline. ETBE is apparently less aggressive than MTBE or TAME in some elastomers.

Before leaving the subject of the effects of ethers, it should be mentioned that one author has expressed concern over the effects of MTBE on materials even at the five percent level.[117 118] These papers describe the effects of MTBE on floating roof tank seal materials. Many of these materials are foams in which considerable weight gain can be obtained as the pore volume becomes saturated with condensate. Due to the expectation of wear in this application, only minor changes in dimensions and material properties can be tolerated. In fact, the author considers greater than ten percent weight gain to be "significant deterioration" for this application and selected PTFE fabrics as the only compatible material. However, these results should not be of concern for the retail gasoline environment. USTs are not sealed in this manner.

7.1.5 Permeation of Polymeric Materials by Alcohol Blended Model Fuels:

Table 10 summarizes permeability and solubility results for gasoline blends with MeOH while **Table 11** presents similar data for gasoline blends with EtOH. Notice that the volume swell of the lower grades of FKM in MeOH blended fuels exceed the limits for reliable seal operation. Even the best grades of NBR swell too much for reliable hose applications in MeOH fuels. The higher molecular weight EtOH is somewhat less aggressive swelling and permeation agent than MeOH.

Table 10 - Permeability and solubility of modified ASTM Fuel C, containing 15 to 20 percent by volume MeOH, in polymeric materials.

ASTM FUEL C + 15 to 20 % volume MeOH								
Material	*Primary Application*	*Permeability ($g*mm/m^2/d$)*	*Solubility ($g/mm*m^2$)*	*Diffusivity (mm^2/day)*	*activity*	*A/L (m^2/mm)*	*Q (g/d)*	*t = 1/D (d/mm^2)*
Elastomers								
FKM	Hose liner Seals	6 to 50	52 to 340	0.11 to 0.15	1	1 to 2	6 to 100	
NBR/blends	Hose	1300 to 2700	370 to 780	2.7 to 3.2	1	0.5 to 1	600 to 2700	
Thermoplastics								
ETFE	Hose liner	0.05 to 0.43			1	6 to 12	0.3 to 5	
PE	Flexible pipe Sump	46			1	8	196	
PA	Flexible pipe liner	27 to 100			1			
Thermosets								
Epoxy	Rigid Pipe							
Polyester	Tank	1	100	0.011				

Table 11 - Permeability and solubility of modified ASTM Fuel C, containing 10 to 15 percent by volume EtOH, in polymeric materials.

ASTM FUEL C + 10 to 15 % volume EtOH								
Material	*Primary Application*	*Permeability ($g*mm/m^2/d$)*	*Solubility ($g/mm*m^2$)*	*Diffusivity (mm^2/day)*	*activity*	*A/L (m^2/mm)*	*Q (g/d)*	*t = 1/D (d/mm^2)*
Elastomers								
FKM	Hose liner Seals	2 to 100	52 to 270	0.03 to 0.37	1	1 to 2	6 to 100	
NBR/blends	Hose	1000 to 2000	170 to 560	3.5 to 5.8	1	0.5 to 1	600 to 2700	
Thermoplastics								
ETFE	Hose liner	0.03 to 0.15			1	6 to 12	0.3 to 5	
PE	Flexible pipe Sump							
PA	Flexible pipe liner	33						
Thermosets								
Epoxy	Rigid Pipe							
Polyester	Tank							

Permeability values represent the sum of all hydrocarbon contributions. Notice that the total mass flow due to permeation is very high even in comparison to MTBE permeation. Fluoroelastomers and fluoroplastics exhibit the lowest levels of permeation in alcohol blends while fluorosilicones and nitrile elastomers exhibit the highest level. Permeation rate drops with increasing acrylonitrile content in NBRs and also drops with increasing fluorine content in FKMs.[119 120]

The permeation values reported for alcohol fuels are "peak" values. Many authors observed the permeation rate to go through a maximum value several days after the test began. This phenomenon has been attributed to speciation.[121] [122] Speciation occurs when the membrane selectively absorbs and permeates one of the components in the solution. In this case, the alcohol permeates very quickly and depletes its concentration in the reservoir. The changing activity of permeant in the reservoir causes the apparent permeation rate to decrease with time.

Several authors reported attempts to improve the measurement technique by increasing the size of the reservoir and other techniques.[123] Therefore reported permeation values will be greatly dependent on the experimental technique employed. In an attempt to introduce some consistency, the permeation values summarized in this review are all "peak" values.

Since there have been no successful attempts to model the swelling behavior of materials exposed to alcohol blended fuels over the entire composition, no attempt is made to estimate the component contribution of alcohol permeation. Because there is substantial excess swelling of elastomers in the alcohol blends, the best swelling models are applicable only over a limited composition range.[124] [125] [126] For this reason, the linear combination rule of **Equation 14** will not apply for scaling component contributions.

The limited data available for swelling and permeation of oxygenated fuels in composite materials, which is shown in the preceding tables, will be discussed below. Epoxy matrix composites are found in rigid nonmetallic piping while polyester matrix composites are found in nonmetallic underground storage tanks.

7.1.6 Thermosetting Materials -- Underground Storage Tanks.

Very limited information is available regarding the sorption and plasticization of isophthalic polyester laminates by reformulated fuels containing 15 percent MTBE. It is generally assumed that MTBE and other ethers will not be as aggressive to FRP as alcohols. Therefore observers have concentrated testing efforts on the effects of alcohol containing fuels. Kamody et al. state, "Test results indicate this is true," but no data with regard to the effects of MTBE were offered.[127] [128] It was indicated that MeOH is very aggressive to FRP, especially those made from less premium resins. Introducing MeOH into older tanks tended to dissolve gums and other polar residues which accumulated throughout the years and wound-up fouling automotive equipment such as fuel lines. Ethanol does this as well but it seems that MeOH is more notorious.

It has been reported,[129] from a seven month immersion study, that reformulated gasoline produced less weight change (actually lost weight) than nonoxygenated gasoline. Loss of weight may be due to extraction of residual unreacted monomers in an unpostcured material. However no data on modulus retention are offered.

Reports of an eight-year immersion study of polyester fiberglass laminates by Fluid Containment indicate that hardness and strength did not vary by more than two percent. Fluid Containment quoted "the MTBE fuel blend acted no differently than the straight gasoline and had essentially no effect on the tank sample after eight years." But, no data on modulus retention are reported.

Certainly there are no data to indicate MTBE is more or less detrimental or permeable to UST materials than is gasoline. There is no theoretical reason to expect strong selective absorption of MTBE by isophthalic polyesters. This is because no strong Lewis acid sites are present in these polymer materials which would drive MTBE absorption by exothermic interaction. The chemical structure of the polyester contains only Lewis base sites (ester linkages and aromatic pi electrons).

However, selective absorption of alcohol by isophthalic polyesters may be anticipated due to a potential exothermic interaction among ester moieties in the polymer and the hydroxyl group of alcohol. Indeed, selective absorption of alcohols is observed. After one, six and 12 months of immersion, 2.2, 3.8 and 4.7 percent weight gain, respectively, were observed for isophtalic polyester immersed in 10 percent MeOH, 10 Percent TBOH balance gasoline blend.[130] Coincident with the observed absorption, a seventy percent retention of flexural stiffness was also observed. Post-curing the laminate significantly improves the resistance of the material to methanol blends.

These results are corroborated by Kamody who observed a 30 percent retention of isophthalic polyester resin laminates after nine month immersion in 30 percent methanol/gasoline blends. Although premium resins show better resistance to methanol, the loss of stiffness of isophthalic polyester laminates in methanol fuels exceeds the levels allowed by UL and ASTM standards.

Broutman and Associates[131] performed immersion testing of tank laminates in alcohol blended gasoline and measured property retention as a function of time, up to 15,000 hours. The property retention data were extrapolated to thirty years. Weight gains were observed to be in the range of two to ten percent, depending on the laminate studied and the oxygenated hydrocarbon immersion media. Interestingly, the laminate exposed to blends of alcohol-gasoline always absorb more weight than they do in either of the neat constituents. They point-out that older tanks, installed before 1979 are more prone to absorption of alcohols than newer tanks designed for 10 percent EtOH service. In older tanks, flexural stiffness retention was estimated to be 70 percent after 30 years exposure to 10 percent EtOH blends while methanol blends retained only 25 percent stiffness. Newer tanks, listed for ethanol service retain properties considerably better. They concluded that gasohol storage may lead to an increased frequency of buckling failures in tanks that were not designed to store these oxygenated fuels.

Graduate work performed at the University of Minnesota[132] generally confirms the observations of Broutman and Associates that swelling of isophthalic polyesters in methanol containing fuels is greatest for the fuel blends rather than the neat constituents. Up to ten percent swell may be expected. A coincidental loss of stiffness of up to 40 percent may be observed after 30,000 hours.

No successful attempts to measure permeation of ethers or alcohols in pipe or tank composites have been reported. Smith Fiberglass apparently attempted to measure permeation of EtOH in fiberglass piping after 31 days exposure and they were unable to find any. It is generally held that since MTBE is a large molecule relative to alcohols, it is not likely to swell fiberglass or permeate through it.

Theory maintains, however, that any hydrocarbon which can be dissolved into a membrane will permeate through it at some rate. For example, the diffusion coefficient of methanol in an isophthalic polyester laminate can be estimated by applying **Equation 13** to some unsteady absorption data reported above. The absorption of methanol into a 6 mm laminate was measured after one month to be 2.2 percent. The total equilibrium absorption was estimated by Craggie et al.[133] to be ten percent. The diffusion coefficient for methanol in fiberglass is now theoretically estimated to be 0.011 mm^2/d. The swelling behavior of MeOH in the isophthalic polyester laminates shows classical Case II permeation. Now the permeability and the total mass flow of MeOH can be estimated for a UST as summarized in **Table 10.** Although the permeability is low, substantial surface area exists for a UST and the total mass flow may not be negligible.

The inability to measure permeation of oxygenated hydrocarbons may be related more to experimental impatience than impermeability of the solvent. For a six millimeter thick laminate, the estimated time to reach steady state permeation of MeOH is estimated to be about 3.5 years. About four months would theoretically be required to observe the first indications of MeOH permeation. This may explain why attempts to measure permeation in fiberglass laminates have not produced results.

One final comment on UST compatibility. The Steel Tank Institute released a rather impassioned statement in an effort to convince its readers of the incompatibility of fiberglass tanks to alcohol blended fuels. Many statements in this publication may be considered controversial. However, it is interesting to note that with all the concern voiced over alcohol blended fuels, no mention is made regarding the effects of MTBE in reformulated fuels on fiberglass UST's. Also no mention is made of fiberglass piping with regard to either alcohols or ethers.

7.1.7 Thermosetting Materials -- Rigid Fiberglass Piping

As with UST laminates, very little information is available regarding the absorption and permeability of oxygenated hydrocarbons in these composites. Generally the matrix material is amine cured epoxy and, as such, is theoretically expected to selectively absorb both alcohols and ethers. However, these components operate under a positive pressure so there is no risk of compressive buckling failure. In tensile loading, continuous fiberglass laminates are very strong and any drop in matrix stiffness is not expected to impact the performance of these materials.

7.1.8 Thermoplastic Materials -- Flexible Plastic Piping.

Flexible piping, running from the tank to the dispenser, is a rather new innovation. HDPE is usually used for this application and it is lined with PA or PK for permeation and swelling resistance. If swelling or shrinking is extensive, the pipe may either sag or pull from its fixtures.[134] However there has been no evidence to show that this is a problem for this type of buried piping.

Permeation of MTBE from flexible piping can be estimated from the available data. Assuming 500 square feet of surface area in a typical gasoline station with secondary containment of underground piping, the fugitive emission is expected to be approximately 8 g/day of vapor into the soil column. This compares with the allowable standard set by UL of 40 g/day.

7.1.9 US EPA Evaporative Emission Regulations.

The reader may have noticed that there is a considerable effort reported in the SAE technical papers regarding the permeability of oxygenated gasoline in elastomers and thermoplastics. This is a direct result of Evaporative emissions regulations enacted as part of the Clean Air Act of 1990. These regulations, in effect since 1994, state that the fugitive emission from an automobile fuel system must not be greater than 2 grams total hydrocarbon per car per day. This amounted to a decrease in the allowable permeation rate by a factor of ten.

Existing rubber fuel lines, NBR/PVC blends, and plastic gasoline tanks, HDPE, could not meet these standards, especially when flexible fuel vehicles were considered. Therefore newer materials[135] and laminated constructions were developed. Some automotive companies returned to steel tanks to reduce fugitive emission.[136] [137] Others developed laminated plastic tanks. [138] FKM-lined hoses were made to comply with the regulation but they are quite expensive. [139]

7.2 Metals

7.2.1 Corrosion by Ethers

There is very little information regarding the corrosion of metals by ethers and, in particular, MTBE. This observation is significant in light of all the corrosion studies performed with alcohols. For estimation of corrosion rates of carbon steel piping in the finishing section of an MTBE plant, a regional corrosion specialist for Shell wrote, "... no corrosion is expected ... "[140] One may anticipate that in relatively benign chemical environments, extensive corrosion studies will not be performed.

One study on MTBE effects looked at the corrosion resistance of zinc, aluminum, and brass (these are active metals known to corrode in alcohol fuels) in neat MTBE and gasoline containing 20 percent MTBE at 20 °C.[141] These metals were not affected by either MTBE solution. However, brass was corroded with water present in the blend.

In another study involving flexible fuel vehicles, a seven percent by volume blend in gasoline was included in a fleet vehicle test.[142] No evidence of fuel system material or component damage was found due to the extended use of oxygenated fuels.

One study looked at the corrosive effects of ETBE.[143] Metals tested included: galvanized steel, cast iron, copper, magnesium, brass, aluminum, 1018 carbon steel, and terneplate. Samples of each of the metals were stored in the fuels to which had been added about 1 percent water. None of the experimental fuels shown were treated with the anti-corrosion additives normally used in finished gasoline. Samples were maintained at room temperature for 168 days. The data show ETBE containing blends to have corrosion rates not significantly different from the neat fuels.

The terneplate showed 12.5 g/yr/12ftsq loss of weight but it was not considered to be of great significance. No detrimental effects of the ETBE on metal parts common to gasoline delivery and fueling system were found.

Therefore it may be concluded that gasoline is a rather benign chemical environment from a metals corrosion perspective and addition of ethers does not increase the aggressiveness of the fuel.

7.2.2 Corrosion By Alcohols

Corrosion rates for methanol have been reported by Lash. **Table 12** summarizes some of the observations.

Table 12 - Corrosion rates for selected metals immersed in methanol fuels at 40 °C for 2000 to 8000 hours (Lash et al.).

Material	*15 percent MeOH* *Average* (µm/year)	*15 percent MeOH* *Lower, Aqueous Phase* (µm/year)	*85 percent MeOH* (µm/year)
SS 304	0.0	0.0	0.0
SS 444	0.0	0.0	0.1
Tin	0.1	0.5	0.2
Brass	1.4	6.7	6.4
Zinc	2.1	10.0	13.9
Terneplate	2.7	12.9	86.9
Zinc-Iron	2.8	13.3	7.5
Zinc-Nickel	2.5	11.9	13.3
Zinc-Cobalt	1.9	9.0	18.1
Cadmium	7.5	35.7	22.9
Steel, CRS	10.0	7.6	1.8
Aluminum 356			24.0
Aluminum 319			55.0
Aluminum 380			63.0
Magnesium			146380.0

With 10 percent methanol blends and one percent total added water, corrosion rates were also reported as summarized in **Table 13.**[144] Weight increases are presumably associated with corrosion product which was not removed prior to weight measurement. Materials to avoid in methanol fuel systems include magnesium and terneplate especially. Also avoid bare aluminum, brass zinc, zinc alloys, and cadmium.

A more recent alcohol blend is called Oxinol. It is a blend 50 percent volume blend of MeOH and gasoline grade tertiary butyl alcohol (GTBA). This blend is added to gasoline to achieve the required bound oxygen content. From a materials point of view, this blend has several interesting aspects. First, the methanol activity is dropped because the volume fraction is lower and because the GTBA disrupts the normal hydrogen bonding characteristic of MeOH. Not much data is reported for this alcohol blend, but it is expected that its aggressiveness to metallic and nonmetallic materials will be reduced compared to straight methanol blends.

Table 13 - Corrosion rates of selected metals in 10 percent methanol blends.

Material	*10% MeOH mg/d/m2*
Zinc	-10.7
Iron	-26.3
Copper	+8 to 11
Brass	+8 to 11
Aluminum	+1.4

7.3 Other Materials

7.3.1 Ceramics

There is no mention of any compatibility or permeability issues for ceramic materials to oxygenated fuel blends in the literature. Nor is there any reason to suspect these types of problems.

7.3.2 Pipe Dope:

There are several indications in the literature which state that freshly applied pipe dope is subject to washing-out by gasoline containing alcohol. Some pipe dope is alcohol-based and the solids may be redissolved if the pipe dope has not had ample time to dry. Washed-out pipe dope can lead to leaks in threaded connectors. PTFE-based tape may be considered as an alternative thread sealant.

7.3.3 Coatings:

Coatings may be found on the inside or outside of steel tanks to protect them from corrosion. Coatings may be organic or metallic.

Organic Coatings:

In the absence of cathodic protection, barrier organic coatings will protect metals if they can be applied and maintained pore free but, this is very difficult in practice. In a laboratory evaluation, it was found that gasohol tends to extract an epoxy coating from a gasoline storage tank.[145] A practice was established to store gasohol in unlined tanks and a recommendation made to study the suitability of various coatings for use in gasohol service.

Several authors indicated the superior performance of urethane based coatings for splash exposure to gasohol. These coatings are automotive finishes, however, and they may not be appropriate for liquid immersion service.

Ethylene acrylic acid copolymer is a polymer coating for steel substrates.[146] It is nonconductive and provides good adhesion to steel and good resistance to MeOH. After a two year immersion tests of coated steel samples in gasoline and M15, M85, and M100 with and without one percent water, there was no evidence of laminate deterioration or adhesion loss on any sample.

Inorganic coatings:

Sacrificial metal coatings such as terneplate, which cathodically protected steel and other structural metals, are inappropriate for systems in contact with alcohol blended gasoline. Terneplate coatings are the most widely used inorganic coating for automotive applications to protect steel gasoline tanks from corrosion. Terneplate is a coating consisting of lead and zinc and many authors report that it is unsatisfactory for use in alcohol services. There is also a danger that corrosion products may become entrained in the fuel and enter the automobile fuel system.[147]

Steel, nickel plate,[148] and also prepainted zinc-nickel has been suggested to work well in methanol, but prepainted terneplate is not acceptable.[149] [150] For replacement of terneplate, tin coatings[151] [152] are most often mentioned (wolynec) as giving excellent performance. Cadmium plate is also mentioned.

Electroless nickel plating can be used to protect aluminum in dry methanol environments but is not recommended in the phase separated wet environments (lash). Anodized alloys 319 and 356 are reported to work reasonably well.

8.0 Review Articles

A general reference book is available which summarizes compatibility data for elastomers.[153] This book contains some information on alcohols and diethyl ether but not the ethers that are commonly used in reformulated gasoline. A summary of unsuitable materials for these pure oxygenates is summarized in **Table 14:**

Table 14 - Unsuitable elastomers for neat alcohol and diethyl ether.

Diethyl Ether	Ethanol	Methanol
ABR	ABR	ABR
	AU	AU
Butyl, IIR		
Hypalon		
EA		
	EU	
EPDM		
FKM	FKM	

In a review article, Davidson[154] mentions that fiberglass UST manufacturers claim tests in MTBE blends show no deleterious effects and therefore they warrant the tanks for thirty years in reformulated gasoline service. All studies indicate that USTs are compatible with MTBE blended gasoline.

Downstream Alternatives, Inc. surveyed major equipment manufacturers in 1997 regarding the compatibility of their products to MTBE and reformulated gasolines.[155] With regard to tanks, piping, seals, dispensing equipment, vapor recovery and related equipment, they concluded, "the data clearly indicates (sic) that gasoline containing MTBE is compatible with all these products. Claims and insinuations that gasoline containing MTBE are not compatible with equipment are not based on scientific evidence."

Other review articles focused on the materials issues associated with alcohol fuels.[156 157 158 159 160 161 162] (F. Black) In addition to materials compatibility issues, drive ability, and emissions were considered. Some interesting observations which these articles have in common are as follows: Materials that laboratory tests indicate as being susceptible in immersion tests do not always give problems in fleet vehicle testing. Therefore, it is sometimes difficult to say which materials are unsuitable based on laboratory testing alone. In general, a material which is resistant to methanol will be at least equally resistant to ethanol. Minimizing water in alcohol fuel systems is one way of reducing corrosion problems. However, magnesium and magnesium alloys corrode very rapidly in dry methanol. This review article, written in 1984, concludes "essentially all of the aforementioned problems can be eliminated or improved by appropriate choice of construction materials."

Alcohols (MeOH and EtOH) have much wider explosive flammability limits than gasoline. Thus the saturated vapor of a storage tank is within the explosive range at normal ambient temperature. Precautions must be taken to shield this vapor from spark or flame. This danger does not exist with straight gasoline or reformulated gasoline.

Alcohol loosens rust and dirt from the walls of fuel tanks or fuel lines of an automobile. A fuel distribution system which has been used in former gasoline service should be completely cleaned out before use of alcohol blends.

None of the aforementioned review articles considered the phenomenon of permeation of fuels and their constituents through nonmetallic materials.

9.0 American Petroleum Institute Documentation

The American Petroleum Institute (API) has released three documents on materials compatibility with oxygenated fuels. These two Recommended Practices and one Publication do not consider permeability issues. The recommended practices consider alcohols only while the publication considers all oxygenated fuels and their neat constituents. **Tables 15 and 16** are copied directly from these Recommended Practice documents.

Table 15 - Compatibility of commonly used materials with ethanol and ethanol blends.[163]

Recommended	*Not Recommended*
Metals	
Aluminum	Zinc-galvanized (ethanol only)
Carbon Steel	
Stainless Steel	
Bronze	
Elastomers	
NBR (Hoses and Gaskets)	NBR (seals only)
CIIR (hoses and gaskets)	CIIR(seals only)
FKM	U
FSI**	
Polysulfide	
Natural Rubber (neat ethanol only)	
Polymers	
Acetal	Polyurethane**
PA	Alcohol-based Pipe Dope**
PE	
PP	
PTFE	
FRP**	

***The manufacturer of the specific material should be consulted.*

Table 16 - Compatibility of commonly used materials with gasoline-methanol/cosolvent blends.[164]

Recommended	*Not Recommended*
Metals	
Aluminum	Galvanized metals
Carbon Steel	
Stainless Steel	
Bronze	
Elastomers	
NBR (Hoses and Gaskets)	NBR (seals only)
CIIR (hoses and gaskets)	CIIR(seals only)
FKM	
FSI**	
Polysulfide	
Polymers	
Acetal	Polyurethane**
PA	Alcohol-based Pipe Dope**
PE	
PP	
PTFE	
FRP**	

***The manufacturer of the specific material should be consulted.*

In 1994 the API published results of a 1992 survey of petroleum and other companies for their use of nonmetallic materials in oxygenated fuels.[165] The survey did not differentiate among oxygenate type or material type in a given class. Forty-four companies responded to the survey, following are some observations from that document.

Regarding the use of elastomers in static sealing, dynamic sealing, tank seals and high shear seals, it is clear that most companies increased their usage of FPM type materials and PTFE for handling oxygenates. Forty-four percent of the companies reported having some sealing problems while 42 percent reported making changes to elastomer seals. These changes are:

- A 12 percent decrease in the use of PU was documented. "Embrittlement of PU" was mentioned as one reason for this decrease.
- An eight percent decrease in the use of FKM was documented. "Swelling of FKM" was the predominant observation.
- A four percent increase in the use of NBR was reported.
- A 600 percent increase in the use of FPM was observed; however one respondent cautioned about the use of FPM below 32 degrees Fahrenheit.
- A 100 percent increase in the use of PTFE was reported , however one commentator cautioned, "valves equipped with PTFE seals are difficult to get good positive shut-off."
- One commentator reported degradation of FRP tank liners by oxygenated fuels.

Most of the above problems were probably encountered while handling the pure oxygenates rather than the fuel blends. One respondent supports this position saying, "15 % MTBE no problems reported. Changed trim (seals) for neat MTBE only."

In 1995, the API sponsored an "O&E Symposium on Materials/Fuels Compatibility." A brief summary of information presented at this workshop is provided below.

- Electrochemical measurements of steel with various compositions of MeOH, Fuel C and water showed less than 0.1 mils per year corrosion rate.[166]
- Manufacturers have recommended the use of fiberglass USTs and piping up to the limits of 10 Percent EtOH, 5% MeOH and 15% MTBE. Gasohols have been used successfully since the late 1970's. MTBE , TAME, ETBE have not been found to be a concern.[167]
- API Recommends consideration of the following dispensing system components when converting a retail station to handle gasoline-alcohol blends: Alcohol resistant materials, Hoses, seals, nozzles.[88]

- It is a common misconception that pure alcohols are more aggressive toward materials than the fuel blends. Flexible piping manufacturers use liners of PA-12, PA-11, PVDF, and PA doped PE to provide compatibility with the fuel blends.[168]

- Sumps are constructed of either FRP or PE. Cross-linked PE is preferred over HDPE as it is stiffer, more chemically resistant, and has better low temperature impact.[89]

- Some case histories regarding submersible pumps in USTs were also reported.
    - Owing to the conductivity of alcohol fuels, electrolysis from electric level gauge caused corrosion of 316 SS casing.
    - Submersible Pump impellers are made from Acetal. Acetal exhibits 0.2 percent swelling in a mixture of MeOH and Gasoline. The swollen impellers locked against the pump stator causing the pump to malfunction. Five thousandths of an inch were trimmed from the radius of the blades.
    - NBR lathe cut gasket seals used in submersible pump flow manifolds were involved in fuel leaks. Leaks occurred when oxygenated fuel was dropped. NBR seals were in use for many years in non-oxygenated fuel. Newer NBR gaskets do not seem to experience this problem.

- Regarding dispensers: Oxygen dissolved in a 93% EtOH, 7% H_20 solution caused corrosion of cast iron rotors in pumps. Certain Aluminum alloys tubing can be corroded 30 mil/year by methanol with water. Treated leather piston cups in 6% of dispensers. NBR and Cork gaskets and o-rings.[90]

- Regarding hoses: Common hose constructions include:[90]

ECO	Inner layer of fuel containing hose.
CIIR	Outer layer of hoses.
NBR	Inner layer of fuel containing hose.
NBR/PVC	Outer layer of hoses.
PA & other Thermoplastics	Hose components in contact with vapors.

  Heat Stabilizer for PA is soluble in MTBE, caused mesh screens to become clogged. NBR is the material of choice for dispenser manufacturers due to cost. Modern NBR's are much improved.

- Regarding nozzles and swivels, common seal materials include:[90]

NBR, FKM	Valve poppets and seals
PTFE	Swivel seals.

- For blends of ideal solvents, the volume fraction of aggressive solute in the swollen elastomer at equilibrium is proportional to the volume fraction of aggressive solute in the mixed solvent or gasoline. Thus the swelling behavior of many common fuel resistant elastomers in blends of gasoline and ethers may be adequately predicted by interpolating the component swelling behavior on a volume fraction basis.[169]

- In non-ideal hydrocarbon blends, the activity or partial pressure of ethanol as well as the non-polar hydrocarbons is nonlinear with its composition in gasoline. As a practical result, the swelling power of the blend is often better approximated by summing the component effects of the neat constituents rather than by interpolating the component effects based upon volume fraction.[91]

10.0 CONCLUSIONS

10.1 Compatibility

For any hardware designed for use in retail gas stations which has undergone testing, there are no documented material incompatibility issues for retail stations dispensing reformulated fuels containing ethers up to 15 percent v/v MTBE. In concentrations greater than about 20 percent by volume, MTBE and TAME cause swelling of some fluoroelastomers which may be excessive for some applications. Swelling of fluoroelastomers in neat ETBE is substantially lower than in other ethers.

UL and ASTM standards suggest chemical resistance performance criteria for nonmetallic piping and tanks. However, testing in MTBE containing fuels is not specifically required. Similar performance standards exist for plastic pipe, elastomeric hoses and seals, there is no evidence to suggest the hardware would not meet these performance standards in applied use.

In contrast, there are numerous material compatibility issues associated with the use of gasohol. API's Recommended Practices addresses materials recommended and not recommended for use with ethanol and ethanol blends and gasoline-methanol cosolvent blends. Generally, methanol blends are more aggressive than ethanol blends towards both metals and non-metals. MeOH blends with TBA are offered which mitigate some materials concerns. Metal corrosion issues include: general and localized corrosion of active metals, galvanic corrosion, electrolytic corrosion, wear, and aqueous phase separation. Issues for polymeric materials include: swelling and softening due to absorption of alcohol, extraction of plasticizers, and antioxidants. Generally, compatible material alternatives are available but they may not be currently in service.

10.2 Permeability

Any solvent which can absorb into a material will also permeate through it. The phenomenon of solvent permeation is therefore limited to polymeric materials. The permeation rate of oxygenated gasoline is greater than nonoxygenated gasoline in common hose materials. In general, alcohol blended fuels are more permeable than ether blends with MeOH being most aggressive. The permeation rate of ETBE is postulated to be considerably lower than other oxygenates.

Greater permeability is observed in elastomers (hoses, seals, gaskets, packing) relative to thermoplastics (flexible piping, sumps, vapor recovery, tubing) and composites (rigid piping). In general, fluorinated elastomers and thermoplastics offer better permeation resistance than nonfluorinated materials. Emissions from composite piping and tanks have not yet been observed. There are not enough data to estimate the total fugitive emission of hydrocarbons from retail stations.

There are no environmental standards that limit fugitive emissions for gasoline retail stations as there are for automobiles. UL-971, for safe operation of underground piping, suggests a permeability limit of 4 $g/m^2/day$ for the primary conductor and 24 $g/m^2/d$ for the secondary containment piping. No other permeation standards applicable to the retail gasoline environment were found.

Standards and procedures exist for measuring the total hydrocarbon permeability of gasoline in hoses, flexible piping, and some other non-metallic materials. No standards were found for measuring permeability in composite tanks or composite rigid piping. Existing standards do not cover mass flow contributions from individual hydrocarbon species. In this reviewer's opinion, existing standards may not be adequate for steady state measurement of certain oxygenated species, particularly alcohols that may be present in dilute quantities in gasoline.

11.0 Recommendations

Establish reliable techniques for determination of the individual contribution of the oxygenated hydrocarbon component to total permeability of gasoline blends in materials of construction commonly found in retail gasoline stations.

Measure directly the permeability of MTBE and other oxygenated hydrocarbons in these materials. From this data and geometrical considerations, estimate the total fugitive emission rates, air and soil, of oxygenated hydrocarbons via permeation through common retail station equipment.

Measure the permeation rate of ETBE relative to MTBE in common polymeric materials. If ETBE is found to be substantially lower, consider the possibility of replacing MTBE with ETBE as the preferred oxygenated component in gasoline.

APPENDIX A

Swelling Data

Table A1 - Volume swell of elastomers exposed to MTBE Blends with gasoline.

		Percent swell by volume								
		Volume percent MTBE in ASTM Fuel C								
Reference	*Material*	*0*	*5*	*10*	*15*	*20*	*25*	*50*	*75*	*100*
f	Fsi		22	23	24	26				
a	FPM	3	3	3	3	2				3
b,c,d,e	FKM-65	8					26	43	105	153
a	FKM-66	15	17	15	18	20				180
b,c,d,e		5					22	37	84	126
g		6					18			
b,c,d,e	FKM-67	5					17	17	53	87
b,c,d,e	FKM-68	4					16	29	65	88
j		4		6	7					
b,c,d,e	FKM-70	3					3	21	38	59
		2					6			
j		4		4	6					
a	Aflas-57	34	38	36	41	42				57
i	ETP									26
j	U	27		19	24					
a	NBR-34	37	37	38	38	38				36
k	NBR	23		22	19					

a) Westbrook TPR 318-90 (140day) [170]
b,c,d,e) duPont data (7day)
f) Virant, et al, SAE 910102 (60°C)
g) Aliosio Ausimont
i) Stevens, 1997
j) Douhit SAE 881667
k) Lebedev added 9% wash-out

Table A2 - Volume swell of thermoplastics and thermosets exposed to MTBE/gasoline blends.

		Percent swell by volume	
		Volume Percent MTBE in Fuel C	
Reference	*Material*	*0*	*15*
Douthit	PA - 6,12	0.50	0.20
“	PA - 6,6	-0.50	-0.50
‘	Acetal	1.00	0
‘	HDPE	10.70	10.90
‘	Fiberglass pipe	-0.43	0.87
Davidson			-1.32 to 2.26
‘	Fiberglass tank	-0.02	-.51

Table A3 - Volume swell of elastomers exposed to ETBE and TAME blends with gasoline.

		Percent swell by volume						
		Volume percent ETBE					*Volume percent TAME*	
		in ASTM Fuel C						
Reference	***Material***	***0***	***25***	***50***	***75***	***100***	***10***	***100***
b,c,d,e	FKM-65	8	8	9	9	10	11	84
b,c,d,e	FKM-66	5	4	5	5	5	6	70
b,c,d,e	FKM-67	5	6	7	7	8	7	41
b,c,d,e	FKM-68	4	4	5	5	5	6	51
b,c,d,e	FKM-70	3	2	3	2	3	2	19
l	U		8			8		

l) Shiblom et al SAE 902132

Table A4 - Volume swell of elastomers exposed to MeOH/gasoline blends.

		Percent swell by volume								
		Volume percent MeOH in ASTM Fuel C								
Reference	***Material***	***0***	***5***	***10***	***15***	***20***	***25***	***50***	***85***	***100***
f	FSi	21			30			25	15	5
m		25					26		9	
q		18		22						9
s		16			25			24	13	
r	FKM-65	7			32			75	120	
n	FKM-66	5			46					135
q		1		21						100
					30			57	85	
	FKM-67	14					24			16
r					14			16	13	
n	FKM-68	5			30					20
r					15			20	22	
	FKM-70				19					
r					7			8	4	
p	NBR-40	29		57	62	57				13
	NBR-34	47				82				
q		51		81						14
s					59			37	15	
s	HNBR-36	23			60			38	14	
	NBR-PVC	28				49				
	NBR-BIIR	95				106				
	NBR-CSM	56				82				
q	U	22		45						11
s	CO	35			80			70	45	
q	ECO	33		77						31
s		40			95			75	50	
q	U	21		58						18
q	Hypalon	61		66						1
q	CIIR	96		81						-4
q	CPE	84		87						-2
q	PS	27		28						3

m) Finney SAE 951066 (60C) o) Baurele Lub eng, 54C q) Abu Isa SAE 800786 s) Mastromatteo SAE 900195
n) Balzer SAE 910106 p) Karg SAE 900196 r) Stevens SAE 880022

Table A5 - Volume swell of thermoplastics and thermosets exposed to MeOH/gasoline blends.

		Percent swell by volume	
		Volume Percent MeOH in Fuel C	
Reference	*Material*	*0*	*85*
	PA - 6,12		
	PA - 6,6		
	Acetal		
	HDPE		
	Fiberglass pipe		
	Fiberglass tank		10

Table A6 - Volume swell of elastomers exposed to EtOH Blends with gasoline.

		Percent swell by volume								
		Volume percent EtOH in ASTM Fuel C								
Reference	*Material*	*0*	*5*	*10*	*15*	*20*	*25*	*50*	*85*	*100*
q	FSi	18		19	20					6
s		16		22						
s	FKM-65	7		23						
s	FKM-66	5		21						
q				6	7					2
c					36					
s	FKM-67	14		14						
s	FKM-68	5		17						
c					24					
s	FKM-70	1		12						
c					18					
p	NBR-40	29								
k				22						
s	NBR-36,	23		58						
q	NBR-34	51		68			99			11
				62						
s	HNBR-36	55		22						
d	NBR-PVC	28		34						
d	NBR-BIIR	95		70						
d	NBR-CSM	56		65						
q	CO	35		50						2
s				65						
s	ECO	40		50						
q	U	21		51		56				19
q	Hypalon	61		81						1

m) Finney SAE 951066 (60C)
n) Balzer SAE 910106
o) Baurele Lub eng, 54C
p) Karg SAE 900196
q) Abu Isa SAE 800786
r) Stevens SAE 880022
s) Mastromatteo SAE 900195

APPENDIX B

Permeability Data

Table B1 - Permeability of some elastomers and ETFE to model fuels containing various concentrations of MTBE.

			Permeability (gm-mm/m²/day)			
			Volume percent MTBE in ASTM Fuel C			
Reference	*Polymer Description*	*Toluene*	*0*	*15*	*20*	*50*
c	NBR-40		192**	176**		
b	FKM-66	88				366
d			7.6	38		
d	FKM-68		7.6	23		
b	FKM-70	9				121
d			3.8	15		
b	Aflas-56	1896				5266
b	ETP-67	16				113
a	ETFE		0.02		0.01*	

* ETBE permeability was found to be 0.05
* Base gasoline of 73 octane was used rather than Fuel C.
a) Goldsberry SAE 930992
b) Stevens et al. ASC (1997)
c) Lebedev et al.
d) Stevens et al SAE 970307

Table B2 - Permeability of elastomers to model fuels containing various concentrations of methanol.

References	*Elastomer*	*Permeability (g-mm/m²/day)*					
		Volume percent methanol in ASTM Fuel C					
		0	*10*	*15*	*20*	*2.75 + TBA 2.75*	*85*
a	NBR-33	1212		2419			361
d	NBR-34	541			1400	891	
k		720		1920			336
d	NBR-34/PVC	294			1321	390	
d	NBR-34/BIIR	875			1257	1472	
d	NBR-34/CSM	915			2665	1194	
a	HNBR-45	369		1421			319
a	FVMQ	597		1067			357
a	FKM-A-66	2.2	50	50			122
c		4.0					95
h		1.0					
a	FKM- B-66	2.1		50			250
a	FKM-GLT-65	5.0		97			461
a	FKM-B-68	1.9	25	21	32		13
c		2.0					43
h		1 .0					
a	FKM GF	1.7		6			1.7
c		1.0					17
a	FKM GFLT-67	3.2		24			17

Table B3 - Permeability of thermoplastics to solutions containing various concentrations of MeOH

		Permeability (g-mm/m2/day)				
		Volume percent methanol in ASTM Fuel C				
References	***Thermoplastic***	***0***	***15***	***20***	***85***	***100***
e	PTFE	0.06		0.23		0.09
g		0.15				
a	FEP	0.18	0.25	0.13	0.28	
g				0.18		
a	PFA	0.18	0.38	0.05	0.35	0.05
e, g		0.01		0.13		
a	ETFE	0.18	0.43	0.04	0.38	0.03
e		0.02		0.13		
g		0.09				
j	HDPE	36	46			20
j	PA-6 plasticized	5	50			36
f	PA-11					18
f	PA-11 plasticized					40
a	PA-12	8.8	100	1.35	102	
g		1.53				
j		41	27			40
j	PA-12 plasticized	34	53			60
g	PA-12,12			1.35		

Table B4 - Permeability of elastomers to model fuels containing various concentrations of EtOH.

		Permeability (g-mm/m2/day)				
		Volume percent ethanol in ASTM Fuel C				
References	***Elastomer***	***0***	***10***	***15***	***20***	***85***
b	NBR	304	1000			
d	NBR-34	541			1066	
d	NBR-34/PVC	294			700	
d	NBR-34/BIIR	875			995	
d	NBR-34/CSM	915			923	
a	NBR-33	1212	2037			
i			1026			
a	HNBR-45	369	1001			
a	FVMQ	597	857			
a	FKM-A-66	2.2	10.0			21
b		4	100			
c			28.0			
a	FKM- B-66	2.1	11.0			
b			53.0			
a	FKM-GLT-65	.5	20.0			
a	FKM-B-68	1.9	5.9			14
b		2	70.0			
c			19.0			
i			4.0			
a	FKM GF-70	1.7	2.2			9
b		1	35.0			
c			12.0			
i			1.1			
a	FKM GFLT-67	3.2	8.4			

Table B5 - Permeability of thermoplastics to solutions containing various concentrations of ethanol.

		Permeability (g-mm/m2/day)	
		Volume percent ethanol in ASTM Fuel C	
References	***Thermoplastic***	***0***	***10***
a	FEP	0.18	0.13
i			0.03
a	PFA	0.18	0.15
a	ETFE	0.18	0.15
a	PA-12	8.8	33

a) Stahl et al. SAE 920163
b) Stevens et al SAE 97037
c) Bauerle Lubrication Eng.
d) Dunn and Pfister SAE 800856
e) Goldsberry SAE 930992
f) Vasselin, Private communication
g) Goldsberry et al. SAE 910104
h) Stevens SAE 880022
i) Fuller & Stevens SAE 960140
j) Weber et al 910304
k) Puisais

Table B6 - Permeability of hose constructions to model fuels containing alcohols.

		Time (days), Permeance (g/m2/d)			
		Volume percent ethanol or methanol in ASTM Fuel C			
Reference	***SAE spec hose***	***0***	***E10***	***E15***	***M15***
	30R7 NBR/CSPE	5, 500	5, 630	4, 640	5, 820
	30R8 CO/CO	7, 180	5, 450	5, 400	6, 800
	30R9 FKM lined	12, 4	13, 15	13, 13	9, 90

APPENDIX C

Physical and Chemical Description of Common Fuel Resistant Elastomers
(Puisais)

Material *Trade Names*	*Structure* *Vulcanization*	*Mechanical* *Properties*	*Chemical* *Properties*	*Thermal* *Properties*	*Other* *Properties*	*Applications*
			Chlorinated Elastomers			
Polychloroprene (CR) Baypren Butachlor Neoprene Perbunan Sovprene Santoprene.	Polymer of chloro-2 butadiene 1,3 (chloroprene). *Vulcanization* By metallic oxides (Zn, Mn)	Good resistance to repeated flexure, abrasion, tearing. Low residual deformation by compression.	Good resistance to aliphatic hydro-carbons. Poor resistance to aromatic and chlorinated hydro- carbons. Not as resistant to hydro-carbons as NBRs. Excellent resistance to ozone and weathering	Limited thermal resistance (95°C in continuous service), resistance to cold until 20°C (embrittles at -40°C).	Low permeability to gas; good flame resistance; average electrical properties; good adhesion to metals and fibers/cloth.	Petroleum: tank covers, tubes, inflatable reservoirs Automotive: Spark plug covers; electrical connectors; motor supports; electrical wiring covers
Epichlorohydrin (CO, ECO) Hydrin Herclor Gechron Epichlomer	Homopolymer: Epichlorohydrin (CO). Copolymer: Epichlorohydrin and ethylene oxide (ECO). Terpolymer: Epichlorohydrin, ethylene oxide, allyl glycidyl ether *Vulcanization* Diamine, urea, or thiourea; or 2-mercapto imidizole	Constant hardness over a large temperature range (-20° to 170°C) low residual compression	Good resistance to oils, gasolines and solvents (low swelling) except in ketones and chlorinated solvents excellent ozone resistance low resistance to water vapor at elevated temperatures.	Good temperature resistance to 135°C excellent flexibility to low temperatures (especially ECO: -40°C)	Low permeation to gas comparable to butyl, superior to polychloroprene and NR low electrical isolation low cost	flexible fuel lines and oil refrigerants; piping systems, diaphragms, pumps.
Polyethylene Chlorosulfone (CSM) Hypalon Herclor	*Vulcanization* By magnesium oxide.	Good resistance to tension and abrasion poor tear resistance. Average dynamic properties.	Good resistance to oils and aliphatic hydrocarbons; poor resistance to aromatic hydro-carbons. Excellent resistance to ozone and weathering, acids.	Thermal resistance to 120°-135°C continuous flexible in cold from -18°C to -23°C.	Good electrical properties to 600V; low permeation to humidity and gases; changes colors. Excellent flame resistance.	Petroleum: reservoir membranes; cable covers; airtight gaskets. Automotive: electrical wiring covers; flex hose connections.

Material Trade Names	*Structure Vulcanization*	*Mechanical Properties*	*Chemical Properties*	*Thermal Properties*	*Other Properties*	*Applications*
			Fluorinated Elastomers			
FKM Viton Fluorel	There are at least many types of fluorinated elastomers, which are commonly based on copolymers or terpolymers of: vinylidene fluoride, tetra-fluoroethylene, hexafluoropropylene, and perfluoromethylvinylether. *Vulcanization* Peroxides, diamines, and bisphenols.	Good in tensile and to tearing remarkable resistance to compression-set	Excellent chemical resistance in a large range of temperatures. Low swelling in oils, fuels, lubricants, aliphatic and aromatic hydro-carbons, mineral acids. Excellent resistance to atmospheric oxidation and weathering sensitive to water vapors poor behavior to esters, methanol; ketones, amines poor resistance to amine based corrosion inhibitors. Increasing Fluorine content generally improves chemical resistance.	Excellent resistance to temperatures resist oils up to 150°C good cold resistance (dynamic from -20° to -40°C according to grade; static to -54°C)	Good electrical properties very low permeation	Petroleum: Wellhead joints; flexible hoses for fuel transport; pumps; cable covers. Automotive: Shafts; rods; valve stems; gasoline filters; fuel injectors; gasoline pumps; carburetor tubing; carburetor valves.
FPM Kalrez Chemraz	Copolymer of TFE and of perfluoromethyl-vinylether.	Similar to FKM.	Resistant practically to all products, except halogenated solvents.	Exceptional thermal resistance to 290°C (continuous); better resistance to cold than the Viton (usable to -30°C).	Inflammable; elevated dielectric rigidity; very high cost.	
Aflas	A copolymer of TFE and propylene. *Vulcanization* By peroxide in association with triallylisocyanurate, at 150° - 180°C and post cured. By diamine	Good rupture resistance, but mediocre residual compression	Excellent resistance to hydrocarbons, lubricants, hydraulic fluids excellent resistance to hydrogen sulfide and carbon dioxide good resistance to amine-based corrosion inhibitors	Resistance to elevated temperatures (200°C continuous) mediocre resistance to cold.	Exceptional electrical resistance good resistance to blistering mediocre resistance to metal	Petroleum: Exposure to high vapor temperatures; corrosive oils; amine-based corrosion inhibitors; hydrogen sulfide and carbon dioxide; *Automotive* Hydrocarbons at high temperatures; inferior resistance to gasolines, except gasohols.
FVMQ Fluorosilicone Silastic FE300	Polymethytrifluoropropyl siloxane family. *Vulcanization* By peroxide	Maximum tensile resistance to 1450 psi.	Good resistance to aliphatic hydrocarbons; poor resistance to aromatic hydrocarbons; moderate resistance to oxygenated compounds.	Good thermal resistance to 175°C. excellent resistance to low temperatures -80°C.		

Material Trade Names	*Structure Vulcanization*	*Mechanical Properties*	*Chemical Properties*	*Thermal Properties*	*Other Properties*	*Applications*
			Nitrile Elastomers			
NBR Perbunan N *Nysyn* Europrene N Hycar Chemigum Krynac Paracril Elaprim	NBRs are copolymers of butadiene-acrylonitrile. The butadiene causes the nitrile to be supple and flexible at low temperatures. The *acrylonitrile brings* about resistance to hydro-carbons and good permeation resistance to gas. *Vulcanization* By sulfur; by peroxides.	*Good static mechanical* property. The rupture resistance and the hardness are elevated when the ACN content is higher. Good resistance to abrasion. Inferior dynamic properties.	*Good resistance to* hydrocarbons. Mediocre resistance to polar compounds. Loses all elasticity in the presence of hydrogen sulfide.	*Limited temperature* resistance (100° to 120°C). good resistance at low temperatures.		Petroleum Handling and transportation of hydrocarbons; uses in hoses for loading/unloading of tankers. *Automotive* lever joints; airtight joints.
2.5.2. Carboxylated Nitriles (XNBR) Krynac 211-221 Hycar 1072 FRN 605 Chemigum NX775	A copolymer of butadiene, ACN, and carboxylic acid.. Vulcanization By sulfur; by metallic oxides.	*Properties* Characterized by exceptional resistance to abrasion; excellent mechanical properties; excellent adhesion to metals.				*Applications* external electrical cable sheaths; turning joints; *anti-explosion joints for* well shafts.
2.5.3. Hydrogenated Nitriles Therban Tornac Zetpol	A copolymer of butadiene-ACN. *Vulcanization* Totally saturated HNBR's *are vulcanized by* peroxides. Partially saturated HNBR's are vulcanized by sulfur or peroxide.	Excellent static property *low retention to* compression good dynamic properties excellent abrasion *resistance*	Excellent hydrocarbon *resistance* excellent resistance to water vapors at 150°C excellent resistance to *amine-based* corrosion inhibitors excellent resistance to hydrogen sulfide and carbon dioxide gases	Good heat resistance can be utilized continuously in temperatures to 140°-150°C. good properties at low resistance.	Good resistance to blistering.	

Material Trade Names	Structure Vulcanization	Mechanical Properties	Chemical Properties	Thermal Properties	Other Properties	Applications
			Acrylic Elastomers			
Alkyl and alkoxyacrylics (ACM) Hycar		Good mechanical property, excellent resistance to compression set.	Good resistance to hydrocarbons excellent resistance to transmission fluid, hypoid oils.	Thermal resistance to -40°C and 150°-160°C.		
Acrylic Ethylene (AEM) (Vamac) Vamac	A copolymer of ethylene and of methylacrylate, with a monomer created at the vulcanization sites. Vulcanization composed of guanidine and primary diamine	Good tear resistance good resistance to fatigue by flexure good vibration resistance from -30°C to 160°C	Good resistance to oils, to weathering and ozone	Good thermal stability to 170°C good behavior at low temperatures; becomes brittle at -40° to -50°C. good fire resistance	Low permeation to gas; good electrical properties; good adhesion to metals and other supports; moderate costs.	*Petroleum* Cable sheaths due to its good fire resistance; flexible hoses for acid gas service. *Automotive* Vamac is used extensively in automobiles due to its thermal resistance to oils; its flexural fatigue resistance; its flexibility at low temperatures; its wear resistance.
			Polysulfides			
Polysulfide (S) Thiokol FA Thiokol ST	A copolymer of *Vulcanization* At ambient temperature by zinc oxide.	Poor	Good resistance to aging and ozone. excellent behavior to oils (superior to nitriles), fuels, and hydraulic fluid. insensitive to water, alkalines, and diluted acids	Limited thermal resistance to 135°C, but excellent behavior in cold. Temperature extremes (-55° to 135°C or -75° to 105°C according to grades).	Disagreeable odor; good adhesion to metal	Caulks and sealants

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ATTACHMENT B

Oxygenate Compatibility/Permeability Survey Form

OXYGENATE COMPATIBILITY/PERMEABILITY SURVEY

California Water Resources Control Board

COMPANY INFORMATION

1. Company Name: ______________________________

   Business Location: ______________________________
   No. & Street   City   State   Zip

   Mailing Address : ______________________________
   No. & Street/P.O. Box   City   State   Zip

2. Name/Title of Survey Respondent: ______________________________
   Name   Title/Responsibility

   Phone No.: ____________________
   Area Code & No.

EQUIPMENT INFORMATION

3. List any equipment products that your company currently manufactures or manufactured in the past for use in underground storage tank (UST) or aboveground storage tank (AST) systems for storing petroleum. Include any products in the following categories:

- Tanks
- Piping
- Sumps
- Hoses
- Nozzles
- Dispensers
- Dispenser Pans
- Spill Containment
- Flexible Connectors
- Connector Containment
- Leak Detection Equipment
- Vapor Recovery Equipment
- Fittings & Breakaways
- Gaskets & Seals
- Sealants & Adhesives
- Tank Lining & Bladders
- Trench Lining
- Tank Vaults
- Filters
- *Other*

Equipment Type, Name & Model No.	Period of Manufacture		Period of Installation in Calif.	
	Start Date	Stop Date	Start Date	Stop Date

EQUIPMENT TESTING INFORMATION

4. Describe any material compatibility and/or permeability testing with oxygenated fuels done by your company or a third party, e.g., testing laboratory, university. Use a separate sheet for each equipment product.

- Equipment Name & Model No.: ______________________________
- Tester & Testing Date(s): ______________________________
  Name of Testing Entity Test Date(s)
- Oxygenates Tested: (fill in table below)

Type of Additive or Alternative Fuel	Concentration in Gasoline		Test Duration	Test Temperature	Permeability	Compatibility
	Minimum % Tested	Maximum % Tested	hours or days	C°	cm/cm2/C°/atm	Properties Tested*
DIPE						
Ethanol						
ETBE						
Methanol						
MTBE						
TAME						
C_3 to C_8 Alcohols						

*Indicate which properties were tested, including but not limited to solubility (SOL), absorption (ABS), changes in hardness (CIH), elongation at breaking point (EBP), stiffness (STF), corrosion rate (COR). Please attach any information you have on mechanical properties.

- **Testing Protocols/Standards.** Describe testing protocol(s) or standards followed and provide the name of the standard, if applicable:

____
____
____

(attach additional information if necessary)

- **Performance Standards.** Describe any product and/or performance standards that the equipment meets or exceeds or that the equipment does not meet with regard to material compatibility and permeability of oxygenates.

____
____
____

(attach additional information if necessary)

- **Warranties.** For which fuel blends and/or fuel additives and for what period of time does your company warranty this equipment? Please attach a copy of any applicable warranties.

____
____
____

(attach additional information if necessary)

STATE WATER RESOURCES CONTROL BOARD'S PANEL ON THE LEAK HISTORY OF NEW AND UPGRADED UST SYSTEMS

UPGRADED UST RELEASE SITE EVALUATION CASE STUDIES
(UST Team 2 Report)

JANUARY 1999

PARTICIPATING TEAM 2 MEMBERS

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I. EXECUTIVE SUMMARY

The Upgraded UST Release Site Evaluation Case Studies Team's task was to evaluate upgraded UST sites where Methyl tertiary Butyl Ether (MTBE) was present in the subsurface, for the purpose of determining site specific factors resulting in a release of MTBE. Local Oversight Program and Implementing Agency files for approximately 26 sites were reviewed and 22 of these sites were visited. Upon investigation of specific facilities, most releases appear to be fuel system leaks. Some of the apparent causes of leaks are faulty installations, poor maintenance, upgrades that do not fully comply with the regulatory requirements and poor facility operation practices. Very few sites show evidence of MTBE contamination only. Therefore, it is unlikely that MTBE is escaping fuel systems without a general leak in the system. In a few cases MTBE was the only constituent found. This may be due to the physical properties of MTBE; it is water soluble and does not easily adhere to soil particles. Other gasoline constituents, on the other hand, are not generally water soluble, adhere strongly to soil particles, and degrade easily in an oxygen rich environment. As a result, MTBE may move more rapidly and farther from the leak source, and be detected in monitoring wells ahead of other gasoline constituents.

Improvements in management of UST programs are needed. Detailed and regular inspections of current UST systems by qualified agency or third party inspectors could result in the identification of some of these problems and enable correction of the deficiencies. More intense scrutiny of installations by qualified regulators or qualified third party inspectors would increase the probability that UST systems are properly installed. Stricter guidelines to insure installation contractors are properly qualified to install UST systems could decrease the incidence of improperly installed systems. Existing State requirements are inadequate because they do not ensure that installation personnel have been trained for specific products. Many manufacturers, primarily tank and piping manufacturers, offer training in the proper installation of their products. Local regulatory agencies should verify that installation personnel have been properly trained in the product manufacturer specifications prior to installation of the system.

The UST regulations appear to be adequate for the design and construction of new systems. However, the requirements for upgrading existing systems, may allow for less effective systems to remain in use. A properly maintained and operated fully double walled or secondarily contained system is less likely to allow a release into the environment than a single wall system.

The scope of work for this team was limited to review of UST release sites where MTBE and other gasoline constituents were detected. No budget was allocated for the project and no actual testing was conducted by the team. The sample population used to conduct this survey of upgraded and new tanks was heavily biased because only facilities which experienced a prior release were addressed. As a result, at many of the sites it was not possible to determine if the release was from a previously removed system or the existing system which meets the 1998 upgrade requirements. Based on this fact alone the team recommends that an evaluation be conducted of UST systems on sites that have not experienced a prior leak. This new study would reduce the amount of unknowns at a site and thus give a more objective view of the UST system.

II. BACKGROUND

The task of this team was to confirm or deny the ability of UST systems, that are compliant with the 1998 deadline requirements, to adequately contain the product they are storing, oxygenated fuel, and more specifically, to look at each component of the system and assess if it is functioning as designed, as installed, and as operated.

In general, there are three types of UST systems that comply with the regulations as meeting the 1998 deadline standards: double wall systems, single wall systems, and hybrid systems, the latter being a combination of the first two. A double wall system is a new system installed after July 1, 1987 and is comprised of a secondarily contained tank(s) and secondarily contained piping. Currently, some new systems upgraded or installed prior to 1995 do not include secondary containment for the dispenser area. Trench lined product piping systems that were used early on, around 1985 to 1989, also fit into the double walled category. Double walled systems are monitored with sensors that detect liquid or vapor that has collected in the interstitial space between the primary and secondary containment of the tank and piping. A sensor is also required in the dispenser pan. Single wall systems were typically installed prior to 1984 and have a single wall tank(s) with single wall piping. A single wall system storing petroleum that is constructed of fiberglass reinforced plastic (FRP) meets the 1998 standards with the addition of striker plates, a spill container, and an overfill prevention device. However, a single wall steel tank storing a petroleum product will need replacement or require lining or an internal bladder and cathodic protection, along with the previously mentioned upgrades for FRP tanks. A typical single walled tank system with pressurized lines is monitored by a combination of the following: Automatic Tank Gauge (ATG) or Statistical Inventory Reconciliation (SIR) and an Electronic Line Leak Detector (ELLD) with the capability of shutting down the turbine if a leak of 3 gph is detected or the system malfunctions or is disconnected. In addition, monthly (0.2 gph) and annual (0.1 gph) piping integrity tests must be performed. A hybrid system, installed between 1984 and July 1, 1987, consists of a double wall tank(s) with single wall piping. The tank is monitored with a sensor that detects liquid or vapor that has collected in the interstitial space between the primary and secondary containment of the tank. The single wall pressurized piping is monitored with an ELLD as described above.

The following approach and general considerations were used to evaluate the UST system included in the study:

1. UST systems included for possible consideration met the 1998 upgrade regulations and had a history of MTBE detected at the site. These were identified in various ways, by local agencies that implement the UST program, volunteers working on the panel, utility districts, and other public entities. A few of the sites evaluated came from investigations initiated following the discovery of releases while installing electrical upgrades.
2. The evaluation included reviewing case files and visiting sites to attempt to identify specific problems associated with the UST system.
3. The sites were already being monitored for MTBE and other gasoline constituents which allowed members to establish contaminant trends over time. An increasing concentration suggested a possible release. However, review of this data could not always provide a definitive answer to whether the release was due to the new UST system or an old UST system previously removed from the site.
4. Once a potential site was selected, the local agency was contacted and asked to provide information relating to the design, installation, and operation of the UST system. The file information was evaluated for 1998 deadline compliance, evidence of an ongoing release, and other possible problems that might indicate the system was leaking or had leaked.
5. If the results of the evaluation met the upgrade and MTBE detection criteria then a site inspection was conducted to verify the UST system components and, if possible, identify leak sources.

III. Findings and Recommendations

Design, installation, and operation/maintenance of the UST system components were investigated and evaluated. For the purpose of this report, the findings have been summarized under the specific system components or activity where weaknesses or problems were identified.

Findings

1 All Tanks

Due to the lack of an allocated budget for testing or unearthing of tanks, the team had no means to identify leaks associated with the secondary containment of double wall tanks. However, a Lower Explosive Limit (LEL) meter was used to test the annular space of six USTs. Of these six USTs, three were found to have a high reading of flammable vapors.

2 Sumps

Turbine sumps were visually inspected at each facility (13 sites had sumps installed) and were identified as one of the potential problem areas of double wall UST systems. The purpose of the turbine sump is to capture leakage from the primary piping carried to the sump, by way of gravity, via the secondary containment piping or from the turbine itself. If the sump is not liquid tight the product can be released into the environment and not be detected by the monitoring system. Another problem resulting from leaking sumps is water intrusion. At six sites (# 1, 5, 7,13, 15, 23) sumps were observed to contain water and/or product. Build up of water in sumps is another complication that leads to false alarms and bypassing or disabling of monitoring systems. Five sites (#1, 7, 13, 15, 23) were observed to have the probes pulled up because of water intrusion. If the monitoring system is not properly operated, leaks from primary piping or turbines may go undetected. Therefore, proper installation, maintenance and monitoring of the sumps is crucial to the containment and detection of leaks. Out of 13 sites that required sumps, nine sites (#1, 3, 5, 6, 7, 8, 10, 18, 23) were identified as having sumps which were improperly installed. Of these nine sites, five (#3, 7, 8, 10, 23) had penetration fittings were either improperly installed or completely missing. Current installation guidelines require sumps to be inspected during installation. There are no requirements to test sumps after the initial testing. The fact that nine of the systems were not properly connected may result from lack of proper installation inspection (i.e., the sump may have never been tested to see that it was liquid tight). Another possibility is that damage or failure may have occurred some time after the initial installation and testing.

3 Lined Trench as Secondary Containment for Piping

The integrity and design of secondary containment for piping systems with lined trenches are not easily evaluated because the end points of the liner are difficult to locate without removing surface features. Testing usually consists of filling the liner with water or removing surface features, and performing a visual inspection. Of the three sites where trench liners were known to exist, two (#8, 10) were improperly designed/installed and two sites (#10, 11) were improperly monitored. If a leak develops in the primary piping it may not be detected if the trench liner is improperly designed, monitored or leaking itself. Additionally, water intrusion into a trench system at one site (#11) caused nuisance problems that may have resulted in bypassing the monitoring system, similar to problems with turbine sumps.

4 Secondarily Contained Piping

Due to the lack of an allocated budget for testing or unearthing of UST systems, the team had no means to identify leaks associated with the secondary containment of double wall piping. Fourteen sites were identified as having integral secondarily contained piping. One system which was reviewed and visited (site #3) utilized non-fiberglass secondary piping (i.e., non bonded systems connections) utilizing hose clamp connections which may not remain liquid tight. In addition, several members of the team have been involved with inspecting sites where similar materials and method of construction have been used. This knowledge coupled with the team's work has prompted a concern for the ability of systems with hose clamp connections to remain liquid tight after installation.

5 Single Wall Piping

The team visited four single wall systems. Single wall fiberglass piping was found joined with steel unions (sites #17, 18) and some piping systems were put together with inadequate epoxy (site #18) and in one case (site #17) silicon caulking was used instead of epoxy. Evidence was found that piping systems were installed with epoxies that were not compatible with the piping material (sites #17, 18, 22). Additionally, gaskets within flexible connectors where found to leak when allowed to dry out prior to being placed back into service (site #3). A majority of all single wall systems were installed prior to 1984. At this time most communities did not have programs for regulating USTs. As a result, standards for installation of these systems and inspections for their construction and tightness may have been non-existent or inadequate.

6 Dispenser Area

Ten sites were observed to have dispenser area secondary containment (dispenser pans). Connections beneath dispensers were found to be leaking at 12 facilities. At 6 of these facilities (sites # 6, 7, 8, 10, 11, 22) the leaks were directly discharged to the environment due to the lack of dispenser containment. At 6 facilities (sites # 3, 4, 5, 9, 16, 19, 23) dispenser containment was adequate to contain the release. Dispenser pans are a part of the secondary containment requirements for new UST facilities (after 1987). However, due to problems with interpretation of this requirement, many systems were installed or upgraded prior to August of 1995 without dispenser containment. After 1995 clarification was issued by the State Board which stated that all new systems must install dispenser containment. In addition, the Board has given guidance suggesting that local agencies require facilities to install dispenser containment, for those not already in compliance, anytime concrete is broken in the area. As a result, a portion of the "new" UST population has not yet installed dispenser pans.

7 Leak Detection

For the leaking single wall piping systems discussed above (site # 17, 18, 22), the leak detection method or the integrity test used did not detect the leak. This was evidenced by the contamination found along the piping run. A possible answer for this problem may be that the leak threshold of the on-site monitoring equipment or third party testing equipment is not capable of detecting a very small release. Over time even a very small leak can contribute to an environmental problem. Improper operation or maintenance of the monitoring systems and disabling or ignoring alarms may also result in leaks going undetected (site #3).

8 Installation

Many of the problems with the UST systems appear to be a result of improper installation or poor maintenance. Many of the problems found with the UST systems may have been discovered during a thorough installation inspection, by either a local agency or a third party (sites #1, 3, 7, 10, 11, 17, 22, 23).

9 Enforcement

In some circumstances, local agency inspections had identified deficiencies in monitoring issues such as line and tank testing, but follow-up enforcement did not occur.

Recommendations

1 All Tanks

Further appropriately funded study is needed to evaluate the integrity/compatibility of double walled tanks.

2 Sumps

State regulations/guidance for proper installation and periodic inspection of sumps should be developed.

3 Line Trenches as Secondary Containment for Piping

Require that all secondary trench lined systems be properly maintained, monitored and periodically tested for tightness.

4 Secondarily Contained Piping

Require that all secondary containment systems, regardless of type, be properly maintained, monitored, and periodically tested for tightness.

5 Single Wall Piping

All single wall systems should be investigated to ensure that they were properly installed.

6 Dispenser Area

Develop a phase-in approach to ensure dispenser containment is properly installed, maintained and periodically inspected at all facilities. The phase-in approach may take into account site specific risk factors.

7 Leak Detection

Develop better testing methodologies for single wall piping systems. If better methodologies cannot be developed or utilized, all single wall piping systems should be evaluated for replacement using a phase-in approach that may take into account site specific risk factors. Stricter enforcement of monitoring system regulations may help insure monitoring systems are properly operated and maintained.

8 Installation

Ensure that all UST systems are properly inspected during installation by trained inspectors and regularly maintained by trained and qualified owners and operators. In addition, UST facilities should be inspected during all phases of installation and at regularly intervals during operation.

9 Enforcement

Ensure that non-compliance is followed by appropriate enforcement. Ensure that local agencies have a mechanism in place to cite, fine, or otherwise easily enforce compliance requirements.

Lead Agency: County of El Dorado
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP Owens Corning (2@10,000) installed 9/28/85
Piping: Double wall flex, Total Containment, Enviroflex installed in 5/93
Dispenser Containment: yes, Total Containment deep boxes
Sump: yes, Total Containment
Spill: Yes, OPW
Overfill: Yes, OPW SO61 drop tube
Striker Plate: yes
Vapor Recovery: Stage I - coaxial, Stage II - balance

Compliance Monitoring:

- Upgrades were done in 1993 by Fillner. At this time sumps and dispenser containment was installed although there are no sensors in the dispenser pans.
- Tidel EMS-3000 for interstitial monitoring tanks and sumps.
- There is a copy of a tank test in the file but it was done on 9/5/97. This was before the two consecutive fails.
- Although it is not required for a double wall tank, they are also using SIR, Simmons, and failed the months of 12/97 , 1/98, and 2/98. There is a tank test by ProTank on 4/3/98 that gave the system a pass for both the tank and the piping.
- Monitor certification form completed on 9/5/98 verified that there are 3 interstitial monitors.
- There are Red Jacket and Vaporless MLLD on the piping.
- No monitoring plan is available for the facility

Site Visit: (10/5/98)

- This site does not have any visual evidence of leaks.
- No sensors were found in the dispenser containment.
- Turbine sump were dirty but had no visual evidence of leaking.

Site Investigation:

- Soil sampling was done at the site in 1993 when the sumps and dispenser pans were installed. No Detect was the result for all the analytes.
- No Unauthorized Release Form for this site to date.
- On June 18, 1998 a Notice to Submit Workplan for Site Investigation was issued by the Regional Board. This action was initiated when 377 ppb MTBE was found in a monitoring well up gradient to the site at a former Rotten Robbie station. This site had always been ND for MTBE and the facility had just recently reported a release based on a fail on their SIR (dates above).
- A report will be sent to the Regional Board by October 1, 1998 that identifies probable leaks.

Action:

The report by Fluor Daniel GTI (9/28/98) found some MTBE and very low levels of Benzene at 0.384 ppb and THPg at 31 ppb in the soil. In the ground water higher levels of MTBE at 212 ppb, Benzene at 170 ppb and THPg at 2.1 ppb were detected. The report suggests that a further study of the site be conducted.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- From the site investigation there were no visible signs of a release from the current system.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping

Lead Agency: County of El Dorado, Regional Water Quality Control Board, R6, South Tahoe Public Utility District

Site Address: Meyers, CA 95501

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FPR clad tanks. 2 (compartmentalized) @ 20,000 Joor - installed on 7/24/96
Piping: primary piping fiberglass-Ameron, secondary containment Total Containment-blue HDPE put together with clamps.
Dispenser Containment: yes, Bravo Box with floats
Sump: yes, Western Fiberglass
Spill: yes, *type unknown*
Overfill: Yes, mechanical float valve in fill tube
Striker Plate: yes
Vapor Recovery: *type unknown*

Compliance Monitoring:

- EBW Auto Stick is being used to monitor the interstitial space and the turbine sumps.
- Red Jacket LLD, XLP
- Repairs are reported to have been done to the regular piping without permit from the local agency.
- No monitoring plan is available for the facility
- No piping integrity tests were available for the site although the piping system does not have shutdown a 3 gph leak.

Site Visit (8/11/98)

- At the time of the team visit the monitoring system was found to be turned off at the breaker and when turned back on was not functional. Therefore, the team was unable to verify the components of the monitoring system. The system is listed as having automatic shut off.
- Both the premium and the diesel were not dispensing product (paper bags over the nozzles).
- The diesel dispenser pan had both product and water in it and the float switch in the box had not triggered the shear valve. Upon inspection with a flashlight we could see that product was leaking from the dispenser piping above the shear valve.
- The was no key available for the other dispensers, the key had broken off in the lock.
- The turbine sumps were inspected and the premium sump had a mixture of water and product. Apparently there is a leak in the primary piping. The sensor was pulled up so that the alarm would not go off.
- There was no significant amount of liquid present in the regular turbine sump. This may be due to a suspected leak in the secondary piping.

Site Investigation:

- There was also a complaint filed about dumping of product at the site on (3/15/94)
- There are two Unauthorized Release Forms (UFR) for this site. The first was for the tank removal (7/26/96) and the second was a leaking diesel pump on the old system (2/16/96)
- A leak was detected by the monitoring equipment and confirmed by a piping tightness test. It was found to be a Flextite flex connection under the dispenser pan on the regular unleaded line. The secondary containment was not tested during investigation of the leak and not tested after the leak was repaired.
- Product in the sump was detected after the repairs had been made. The lines were tested again and a leak in the secondary containment was found in addition to a leak in the unleaded plus line.
- We have copies from a on site investigation but it provides no date. GPT-1-14 at 2,800ppb, GPT-21-22 at 3,900ppb, GPT-29-22 at 3,500ppb (these are the highest readings)
- Lahontan Regional Board is currently in charge of remediation that had been implemented in order to

contain the plume.

Action: None apparent at this time (8/11/98)

Actions to be taken:

- The facility was closed down on 8/12/98 by El Dorado Co Health.
- A work plan was developed to find the source of the ongoing leak on the site. Helium testing will be used to located the leak in the regular and super lines.

Regular Piping

Secondary Containment

- 9/18/98 Two clamped joint areas were found to be loose and hole was found.
- 9/24/98 Failed a pressure test
- 9/24/98 Two clamps are tightened and the hole is temporarily patched to continue testing. Another leak is found and a clamp is tightened.
- 10/2/98 The primary piping passed the pressure test. The secondary containment is fixed now that the system is tight.
- 10/2/98 More leaks are found in the secondary containment and clamps are tightened.

Regular Tank

Turbine Sump Area

- The electrical penetrations for the conduit to the turbine are the source for leakage from the sump. The penetration fittings were improperly installed.

Super Piping

Primary Containment

- 9/24/98 Failed pressure test
- 9/28/98 Leak was found at the flex connector under the dispenser.
- 10/1/98 The flex connector was replaced and the pressure test passed.

Conclusion

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Prior to the team visit the monitoring system had detected a leak in the primary regular unleaded piping. Once the piping was repaired proper procedures were not followed to ensure that the line was free from any further leaks. This are inspection and enforcement issues. Any time piping is repaired the primary, as well as the secondary piping should be pressure tested to ensure that the repair was effective and the system was put back together properly.
- At the time of the team's visit the site was unmonitored. The system's power had been disconnected by the facility operator by switching off the circuit breaker.
- At the time of the team's visit the facility had two leaks to address, the diesel dispenser and the primary premium piping. In addition, there were leaks found in the secondary piping after the initial repairs were made.
- The primary diesel piping was found to be leaking in the dispenser area and as a result of the dispenser containment the release was not allowed to reach the environment.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- During the repair of the system the premium turbine sump penetration fittings were found to be installed backwards. As a result the product that leaked from the primary and was carried to the sump was allowed to seep out through the improperly installed penetrations. It is not known why the monitoring system did not detect this condition although improper use or alteration is suspected.

Lead Agency: County of El Dorado
Site Address: Meyers, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP 3 @ 10,000 & 1 @ 6,000 installed on 10/20/90. *Xerxes*
Piping: Double wall FRP was installed in 1990 and again in 10/96. At this time it is not know why the relatively new piping needed to be replaced.
Dispenser Containment: Yes, Western Fiberglass, deep box, with Beaudreaus installed in 10/96 when the second round of DW FRP went in 1996.
Sump: Yes, Western Fiberglass, FRP
Spill: Yes, OPW, 2100, 5 gallon
Overfill: Yes, OPW 61SO drop tube and a ball float valve.
Striker Plate: Yes
Vapor Recovery: coaxial

Compliance Monitoring:

- Facility Inspection report filled out for 7/2/97 and 8/11/98.
- No monitoring plan is available for the facility
- An EBW Autostick sensor is used to monitor the interstitial space and the turbine sump for the piping. (There are currently no sensors in the dispenser pans and this deficiency was noted on the inspection report on 8/11/98).
- The inspection sheet indicates that the sump sensors are not programmed to perform shutdown for the pump in the event of a release yet there have been no annual piping tightness tests submitted since the install in 1990. There was no indication of a piping tightness test done when the new DW piping and the dispenser pans were installed.

Site Visit: 10/1/98

- The facility has excellent housekeeping practices except for their diesel dispenser used by the public agencies.
- Beaudreau sensors have been installed in the dispenser pans.
- The dispenser pans were clean and dry although the piping under most of the dispenser (Wayne dispensers) was visibly wet. This may have been where the leaking originated prior to the installation of the dispenser pans.
- All the turbine sumps were clean, dry and the sensors were working.
- There is no visible evidence of a leak at this site.

Site Investigation:

- MTBE found in the municipal wells in the are prompted the investigation. Site investigation found MTBE in the ground water below the site.
- An Unauthorized Release Form was file in 1998 but release was supposedly from old tanks found at closure, 4 SW steel tar wrapped. The date on leak discovered is 9/12/90. The analysis at the time of removal did not detect any gasoline constituents only diesel and oil & grease.
- A new Unauthorized Release Form was submitted stating that the old tanks must have leaked when there was no apparent investigation into the new tank system. No sampling was done, in order to confirm this assumption, when the dispenser pans were installed. Sampling might have picked up the contamination that currently existed.
- In 1998 GP1 MTBE - soil 4-6' **180 ppb** and 14-16' **18 ppb** 2/18/98 near the pump islands.
- In 1998 GP3 MTBE - soil 14-16' **71 ppb** 60' north of GP3.

Action:

Installation of dispenser pan sensors is in progress.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- From the site investigation there were no visible signs of a release from the current system.
- It is believed that the high levels of MTBE may have come from the dispenser piping prior to the installation of dispenser containment.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad FRP compartmentalized 12,000/8,000, installed on 10/15/96, Modern Welding
Piping: Double wall flexible installed on 10/15/96, Enviroflex
Dispenser Containment: yes, Western Fiberglass
Sump: yes, Total Containment
Spill: yes, Emco Wheaton 6 gallon
Overfill: Yes, OPW 61SO drop tube
Striker Plate: yes
Vapor Recovery: Healy

Compliance Monitoring:

- No monitoring plan available for the facility, Interstitial monitor Incon TS1000 EFI is listed.
- Tank tightness testing by Tanknology NDE Vacutest on 8/23/97
- Piping tightness testing by Tanknnology on 8/23/97
- Install sheet says that the system has auto shutdown for the turbines.
- No inspection since installation in 10/96
- No annual maintenance of monitoring equipment
- Vaporless LD2000 MLLD in use.
- A report from TerraVac on July 20, 1998 gives details on the status of the UST system. This report suggests that the system was improperly installed and not properly maintained and operated.
- The report states:
    - ♦ The dispenser pans contained 25 to 40 gallons of water and sludge. Piping penetrations may be the culprit here.
    - ♦ The piping does not flow back towards the piping sump.
    - ♦ One of the dispenser pans was grossly deformed. The product-pipe test collars were still in place and tightly fastened, showed deterioration, and were improperly installed.
    - ♦ Levels of MTBE in the liquid sampled from the turbine sumps and dispenser pans are as follows: M-1 and 2 are 23,000 and 22,000 respectively and D-1 through 5/6 are 11,000, 35,000, 89,000, and 44,000 respectively.
    - ♦ The vapor system would not pass initial testing and was repaired.
    - ♦ Maintenance records could not be located at the site.
    - ♦ The current filters are not dated and maintenance records could not be located by the station attendant. Filter changing records were not available.

Site Visit (10/5/98)

- This site has experienced problems associated with high ground water.
- Housekeeping practices at this facility were not good.
- The Enviroflex piping was joined together with clear small plastic tubing connecting the pipe interstices in the dispenser pans only. The secondary was open in the turbine sumps (at the tanks). Any leaks in the primary pipe should flow back to the turbine sumps. The liquid would accumulate in the turbine sumps until the liquid sensor detected the liquid, and set off the alarm.
- Liquid (a mix of water and fuel or only water) was visible in sumps and the sensors had been pulled up so that the alarm would not go off.
- To verify that the alarm was functional it was placed in the liquid in the bottom of the sump and it did go off with a visual and audible alarm. Neither of the turbines were running so it was not possible, at that time, to tell if the system had shutdown for the turbine.

- The dispenser pans were not equipped with sensors.
- The dispenser pan and piping looked as if it had leaked in the past. There was a build up of debris in the bottom of the pan that appeared to have been wet a some point.

Site Investigation:

- Tanks were removed on 9/9/91 and it is not clear why there were no tanks at the site from 1991 until 1996.
- UFR was filled out in 1991 due to the tank closure.
- MTBE was first discovered on the site from sampling analysis in February 1997.
- The most current monitoring results are from 12/97 and describe injecting diluted 10% hydrogen peroxide into the wells and the reduction of MTBE as a result.
- On June 26, 1998 the Regional Board issued a Notice to Immediately Conduct Remedial Activities at the site. A work plan was requested to describe the actions employed to determine if the dispensers are potential leak sources.

Action:

none other than listed above

Conclusions:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- There is no information in the files to suggest that any work has been done on this system since the 7/20/98 evaluation by TerraVac.
- This site has in the past and was, at the time of the team visit, bypassing the monitoring system by elevating the sensors in the turbine sumps. This is an enforcement issue.
- In the turbine sumps, the piping and the turbine should be considered potential leak sources and evaluated as such.
- The dispenser area should be investigated as a potential leak source.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad with FRP, 1@ 10,000 and 1@ 8,000 installed on 9/89, Trusco
Piping: Double wall FRP installed on 10/89, AO Smith (see comments under site visit below).
Dispenser Containment: none
Sump: yes, FRP with no penetration fittings only caulk. The cover for the sump is the wrong size.
Spill: yes, found to be defective but replaced on 8/14/98
Overfill: Yes, OPW
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- No Monitoring plan in the file, Interstitial monitor Universal, Leak Alert
- Contract upgrade progress report for 8/12,13,14/98
    - Report suggests that the double wall piping does not currently terminate in the sump.
    - The sumps will be lake tested.
    - Overfill will be replaced.
    - Spill buckets will be replaced.
    - Shutdown of the sump sensor could not be confirmed by the contractor.
    - Contractor was to check the monitoring system.
    - Install fill sumps.
- From the inspection on 5/29/98 the alarms were not operating (turned off or not functional?) The probes in the turbine sumps were disconnected.
- A tank and piping test was performed by Champion on 5/8/98, Pass

Site Visit 10/1/98

- Very bad housekeeping practices at this facility.
- The installation is also a source of problems.

  The Sump

    - The piping, at the time of the visit, terminates in the turbine sump. This may have been a major source of leakage if there were or are any piping problems.
    - There are no penetration fittings on the sumps and caulking is used to seal the penetrations.
    - At the time of the re-inspection the sumps were said to have held water.
    - The sump covers are the wrong size.
    - The electrical conduit has been sealed with caulk and as a result of an incorrectly screwed on ....and the box is full of water.
- Dispensers have no pans. In all four dispensers it is impossible to tell by visual inspection whether the system is DW. In one dispenser there is a boot visible but it is still impossible to see the secondary containment.
- One dispenser was leaking product, the piping was wet and the ground stained.
- The cement around the dispensers was stained and look as if the hoses may have leaked. The staining may be due to the carelessness of the person filling the vehicle's tank and spilling fuel on the pavement.
- The monitoring system was functioning although there is no turbine shutdown, no ELLD, and no evidence of annual piping tests.
- The spill containment and the overfill protection devices have been fixed and appear to be in working order.

Site Investigation:

- UFR was reported on 11/30/89 as a loose fitting detected at the tank closure.
- UFR was reported on 1/31/97 as an unknown source discovered by subsurface monitoring.
- MTBE was first discovered on the site from sampling analysis in 3/25/96.
- On June 15, 1997 a Cleanup and Abatement Order was issued as a result of MTBE contaminating wells in the area. The facility owner/operator was to conduct quarterly monitoring, identify the cause of the gasoline constituents in the ground water, stop the release, define the plume, and implement a corrective action plan to clean up the area.
- The problem was found to be a defective overfill device and spill bucket. There may have been multiple events but this cannot be confirmed.
- *Ground water monitoring was done on 4/18/98 and yielded an all time high level of MTBE at the site* of 1,230,000 ppb. The recovery well that this sample was taken from was found to have 9.25 feet of floating product.

Action:

none at this time

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Work has been completed on the turbine sumps at the site but it appears to be of an inferior quality. This is an installation issue as well as an enforcement issue
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.
- The secondary piping does not visibly terminate in the dispenser area and until recently the secondary piping had not terminated in the turbine sump. This may have contributed to the level of contamination at the site. These are installation and enforcement issues.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

<u>System type:</u> Pressure
<u>Tanks:</u> Double wall FRP (3@ 12,000) installed on 9/95
<u>Piping:</u> Double wall FRP installed on 9/95
<u>Dispenser Containment:</u> yes, Bravo Boxes (float switches)
<u>Sump:</u> yes, fiberglass
<u>Spill:</u> yes, appear to be 3 gallon not 5 gallon
<u>Overfill:</u> Yes, ball float and the TLS-350 showed an overfill electronic alarm
<u>Striker Plate:</u> yes
<u>Vapor Recovery:</u> coaxial - EMCO Wheaton, assist

Compliance Monitoring:

- Tank & piping tightness testing by NDE Alert 1000 11/10/95 at install, pass.
- There is no monitoring plan available for the site.
- There is no evidence of any type of annual equipment inspection or piping tightness testing for the *facility*.

Site Visit (8/2/98)

- All of the dispenser pans' floats were out of adjustment. Even though there was standing water in most of the containment box sumps the float switch had not tripped the shear valve.
- Two out of the three turbine sumps had over 4" of standing water. It could not be determined (at this time) if this was due to groundwater or runoff from the pavement.
- The turbine sump sensors had been pulled up off the bottom of the sump so that the water in the sumps would not activate the alarms.
  - The amount of corrosion on the bolts on the manway covers suggests that they have not been removed for a long time.
  - The time of year, September, would indicate that the sump may have accumulated water from washing off the pavement and not rain water, yet the pavement appears to be sloped away from the covers. September would also find ground water at its lowest point of the year.
- The test boots on the secondary piping in the turbine sump were still on. These boots should have been slid back off the secondary after the piping had been tightness tested (11/10/95).
- The Veeder Root TLS-350 was not giving the proper responses, no alarm history could be brought up and we were unable to verify the number of interstitial sensors hooked up to the system (programming may be incomplete) and if the system was capable of turbine shutdown. From the records, it would appear is if they should have shutdown since they have not submitted a piping tightness test since installation of the piping. Since there is no monitoring plan for the facility we were unable to make a determination on the issue.
- General housekeeping at the site was very good.

Site Investigation:

- This site is one of three in the area, Meeks Lumber and The Muffler Palace, that may be responsible for an ongoing problem in the area. This problem was first discovered in 1984 by South Tahoe Public Utility District (STPUD).
- The site investigation was prompted by a nuisance report on 5/16/84, URF filed.
- Because of what STPUD called a lack of effective containment of the plume, a site hydrogeological investigation was started by STPUD in 1992.
- A Cleanup and Abatement Order was issued on January 1, 1985. The tanks tested tight but the turbine was found to be leaking.
- The UST system was removed in October of 1995 because they were believed to be hindering the

progress at the site. Although, at removal the tanks appeared intact, however, the contractor did not carefully excavated the piping as requested by the RB and it was difficult to determine if the piping was the source of the leak.

- MTBE monitoring started as early as 4/10/95 although there is only intermittent sampling for the oxygenate.
- The highest level of MTBE found on 4/2/98 is in MW3 located adjacent to the tank pit, 2084 ppb (↑↑ by 2004 ppb for the last quarters report) with TPHg at 2200 ppb (↑), Benzene at 19.8(↑), Toluene at 3.7 ppb (↓) and Xylene at 22.6 ppb (↓). Ground water fluctuation varies seasonally, depth to water from 1.83 to 12.00 feet.
- Draft work plan due on 5/12/97 initiated from a Cleanup and Abatement Order.
- On 6/26/97 an amended work plan was implemented.

Action:

- Currently, there is an air sparge/soil vapor extraction system in place. Additionally, hydrogen peroxide injection has been used at the site. The report concludes that due to a malfunctioning pump the effect of the hydrogen peroxide on the hydrocarbons will most likely not show in the second quarter monitoring report.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Liquid in the secondary containment is a problem in the turbine sumps and dispenser containment. Because of the water intrusion the monitoring devices in both location were altered and not functioning as designed. This is an enforcement issue as well as an installation issue.
- The source of water intrusion, from ground water or surface water, should be determined and efforts made to correct the problem. This are an enforcement and an installation issues.
- The test boots must always be removed from the secondary piping after a piping tightness test so that the system can function as designed. If the boots remain on any release will build up in between the primary and secondary piping and back up into the dispenser area that may not have secondary containment.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- The monitoring console was unable to give general information or an alarm history and there is no evidence of an annual maintenance check for the facility. This is an enforcement issue.
- This site has in the past and was at the time of the team visit bypassing the monitoring system by elevating the sensors in the turbine sumps. This is an enforcement issue.

Lead Agency: El Dorado Co.
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall bare steel (tar wrap), 4 @ 12,000 with 2 being manifolded, that were installed in 1983. The tanks were lined by Chadborn in early August of 1994 and an impressed current system was installed.
Piping: Single wall FRP, A.O Smith, Red Thread, vent lines steel, vapor recovery FRP(only two observed at the site).
Dispenser Containment: none
Sump: none
Spill: Yes
Overfill: Yes, fill tube mechanical float
Striker Plate: Should have been installed when the tank was lined.
Vapor Recovery: Stage I -coaxial, Stage II -balance system

Compliance Monitoring:

- No documentation supporting the structural integrity of the tank, the lining certification, and the impressed current system could be found in the files. There is documentation stating that there was an ultrasonic and a visual inspection conducted by William D. Clark, PE and a cathodic protection certification by Daniel Chadborn.
- Monitoring listed as Veeder Root TLS 350, ATG and LLD.
- Facility inspection done on 4/14/93.
- Line tightness test done on 4/28/94 by Horizon with Arizona Instrument equipment.
- Facility inspection done on 5/14/97
- No monitoring test results have been submitted since 4/94.
- No groundwater quarterly monitoring reports have been submitted since 9/95.

Site Visit (9/2/98)

The team arrived at the site at 10:00 am to witness the removal of four single wall steel tanks that had been lined in the early 1988. One tank was sitting up higher than the other four tanks and over half way exposed. The other three tanks were only partially exposed with their ends still buried.

- The fumes from the excavation were strong and the soil was discolored and appeared to be wet particularly in the fill and turbine areas.
- Pieces of the lining material were laying around and seemed to be quite thin although they may have been from the manways that were pulled off or the top of the tank. A sample of the lining was examined and it appeared to be brittle and thin, approximately 62 mils (1/16 of an inch). The NLPA Standard 631 states that the lining should have a minimum thickness of 100 mils and an average thickness of 125 mils.
- A piece of the SW FRP piping was recovered and appears to have been leaking due to the varnished look along with a break in the fibers.
- At one dispenser it did not appear that all gasoline products had been piped with vapor return. The lines were not manifolded at this dispenser so that only phase 2 was available for the premium.
- The tanks were stained at the turbine and fill ends. It looked as if the turbines had been leaking for a long period of time.
- As a result of the removal taking longer than expected, the team was only able to witness one tank coming out of the pit. The tank was tar wrapped and some of it was still intact. The tank had some pitting and corrosion but no holes could be identified.

Site Investigation:

- URF filed in 3/17/87, leak discovered on 10/11/83 and recorded as a structural failure of the tank.
- There are 11 monitoring wells at the site, 1 vapor extraction well and 3 dual sparge wells.

- The facility report filled out by the LA says that they notices an area of collapsed asphalt on 5/13/98
- The permit for this facility was revoked by the LA on 8/13/98. The facility is scheduled to pull the tanks and replace them starting on 9/2/98.

Action:

A new system is being installed

Conclusions:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site other than a limited visual inspection of the first tank that came out of the ground during the removal.
- From the wet look of the soil and odor emanating from the UST system it was apparent that the system had been leaking in both the turbine sump and dispenser area.

Lead Agency: Sacramento Co
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP (2@10,000 and 1@12,000) Xerses as per TOSCO. All three tanks contain gasoline.
Piping: Double wall FRP with flex joints in sump
Dispenser Containment: yes, fiberglass, without sensors
Sump: yes
Spill: yes
Overfill: Yes, drop tube
Striker Plate: not present or observed to be
Vapor Recovery: VaporVac system, Assist, Wayen

Compliance Monitoring:

- Veeder Root continuous interstitial monitor, TLS 350
- Vaporless LD2000 and Red Jacket FX1, MLLD, the last maintenance was on 5/6/98, pass.
- Facility maintenance was on 5/6/98 by Triangle Environmental
- Vapor system was tested on 2/23/97, pass.

Site Visit (10/26/98)

- Dispenser pans are dry and clean. Some of the piping under the dispenser appears to be seeping but not enough that there is any accumulation in the pans. The piping is hard piped into the dispenser with a short flex joint connecting to the piping below the shear valve.
- The dispenser pans are not monitored. The pans have been wired but there are no sensors present or any records suggesting the pans are visually inspected on a daily basis.
- The turbine sump also appear clean and dry. There were vapors present when the covers were taken off. This may be attributed to the vapor system.
- There are portions of the asphalt that look as if there could have been a spill. Dave will check the high level alarm history to see if this may have been a problem.
- Overall, this system appears to be tight and the facility is clean.

Site Investigation:

- New tanks were installed in 1987.
- Nine (9) monitoring wells, three (3) vapor extraction wells, and one (1) air sparging point installed at the site in 1987.
- Fiber trench was removed and the double wall piping was installed in 1996.
- MTBE has been tested for at the site since 12/1/95 in MW 1 and MW2. There has been an increasing trend with a few dips. The high being 6100 ppb in MW2 on 12/18/97 and a low of 37 ppb in MW 2 on 9/4/96.
- The release of MTBE is associated with TPH and both.
- The latest quarterly monitoring well reports show a rise in MTBE levels of MW1 & MW2.

Action:

none to date

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Sensors should be installed in the dispenser pans.
- From the site investigation there were no visible signs of a release from the current system.

Lead Agency: Sacramento Co
Site Address: Folsom, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@10,000, installed on 1982, Owens Corning
Piping: Single wall FRP installed 1982
Dispenser Containment: no
Sump: yes, but not liquid tight
Spill: yes
Overfill: Yes
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Automatic Tank Gauging done at site with a Ronan X76 ETM
- Red Jacket LLD were used to monitor the single wall piping.
- Annual tank tightness test done by TankTek 8/13/98
- Annual piping tightness test done by Tanknology NDE on 2/16/98, 2/20/97, 3/31/96

Site Visit (at the time of removal 01/98)

- Piping was tested tight but when excavation of the area was conducted to install the upgrades the piping fell apart at the joints.
- Soil contamination was present at the dispensers, which was later confirmed by testing.
- As a result, the piping was replaced with double wall FRP piping and dispenser pans.

Site Investigation:

- The site experienced a piping leak in 1988 that prompted remediation work at the site.
- In May of 1998 the site was upgraded by the addition of dispenser pans and turbine sumps. During this non required upgrade work inferior piping and contamination were found.
- Soil sampling results from EPA 8020 indicated that the piping under the dispenser had been leaking T-1 at 6.4 ppm MTBE.
- MTBE was also found to be present in the ground water at the site in January 1998 after sampling was done in a monitoring well adjacent to the tank. In soil at a depth of 16 feet, 0.86 ppm, and at a depth *of 31 feet, 2.6 ppm. In groundwater at a depth of 18.11 feet, 4.7 ppm.*

Action:

none other than listed above

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.

Lead Agency: Sacramento Co
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@10,000, installed in 1982, Owens Corning
Piping: Single wall FRP
Dispenser Containment: none
Sump: none
Spill: yes, 1982
Overfill: none
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Ronan X76 ATG
- Red Jacket mechanical line leak detector on the single wall piping.
- Annual line tightness testing on 7/29/97 (PetroTite) pass, 4/7/97 (Tanknology-NDE) pass, 3/1/96 (NDE) pass, 3/31/94 (NDE) pass.
- Using MIR as a leak detection method in 1995.
- The regular unleaded tank failed a tightness test in 1988.

Site Visit (at the time of removal 5/12/98) The removal was prompted by evidence of leakage when the piping was exposed to perform electrical upgrade work.

- Two piping joints came apart when the excavated piping was moved and both had evidence of leakage into the soil. The two types of FRP piping were incorrectly installed with incompatible epoxies.
- There was also evidence of product leakage below one of the dispensers that had a combination of steel unions and fiberglass at the dispenser hook up. The steel unions, not intended for burial, should never have been used in this type of application.

Site Investigation:

- Soil contamination was present at the dispensers and along one of the piping runs, which was later confirmed by testing.
- The five soil samples collected beneath dispensers contained TPPH, benzene and MTBE at concentrations ranging from ND to 1200 ppm, ND to 4.1 ppm, and ND to 120 ppm respectively.
- The soil samples were analyzed for MTBE using EPA Method 8260.

Action:

The single wall piping was replaced with double wall FRP piping

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from leaking dispenser piping.

Lead Agency: Sacramento Co.
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@ 12,000 and 1@ 500 installed in 1983, the 2 Regular tanks are manifolded
Piping: Single wall FRP installed in 1983
Dispenser Containment: no
Sump: no,
Spill: yes, type unknown
Overfill: none
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Automatic Tank Gauging done at site with a type unknown
- Red Jacket and Vaporless Mechanical Line Leak Detectors were used to monitor the single wall piping
- Annual tank and piping tightness test done by Triangle Environmental 10/6/97, 10/14/96, 9/21/95.

Site Visit (at the time of removal)

- The piping was found to be inferior quality at the facility. There were three different types of piping found: Ameron, Smith , and steel piping and fittings. These piping types were not installed as required by the manufacturer.
- As a result, this site will be re-piped and turbine sumps and dispenser pans will be installed.

Site Investigation:

- During a precision tank test on March 19, 1987 approximately 2,600 gallons of fuel was accidentally released to the subsurface.
- Due to the date of release it can be assumed that the fuel did not contain MTBE. Therefore, any MTBE found at the site would be from a new and ongoing release.
- The latest quarterly monitoring report for the site shows increasing levels of MTBE. At MW1, during the last year, MTBE has gone from 4,800 to 11,000 ppb. In MW3 all other gasoline constituents have shown decreases while the MTBE shows an increase, currently 57,000 ppb. It appears that all results have been from EPA 8020 not 8260.

Action:

- New piping has been installed.

Conclusion:

- This site meets 1998 deadline standards except for an overfill device.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.
- The high level of MTBE in MW1 near the tanks by be due to the lack of a turbine sump or may be from the tank itself. A closer look at the tank may be necessary to rule out further contamination.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP (2@ 10,000) Owens Corning installed in 4/1/88
Piping: Fiber trench installed on 4/1/88 and permitted as a DW system.
Dispenser Containment: *unknown, type unknown*
Sump: *unknown, type unknown*
Spill: yes, *type unknown*
Overfill: could not verify, *type unknown*
Striker Plate: *unknown*
Vapor Recovery: *type unknown*

Compliance Monitoring:

- The *tank/piping* is monitored with a Pollulert FD-102 and a Veeder Root TLS-250, ATG is used for inventory.
- On the service station monitoring system certification (7/10/96) the piping is recorded as SW and not a trench system.
- Piping tightness test was done 7/10/96 by NDE and passed
- No monitoring was found in the trenches.
- Site is currently monitored with a Gilbarco system.
- Could not verify dispenser containment by the trench.

Visit on 9/17/98

- The site was missing a number of the required components to meet the 1998 upgrade requirements.
- In addition , the monitoring system had been changed out without notification or inspection by the local and the site appeared to be poorly maintained in general.
- The annular space of the super tank was tested with a LEL meter and it registered as 30%.
- No monitors were found in the trench system.
- The site was being partially monitored by a Gilbarco system.

Site Investigation:

- URF was filed for a release on 1/8/86. The cause of the leak was a structural failure at closure. The agency records show the tanks were installed on 4/1/88?
- Free product was detected in a Pollulert well located adjacent to the UST on June 30, 1987. Three borings and four monitoring wells were installed at the site in July 1997. Soil and ground water contamination was detected. The site has been on a quarterly ground water sampling program since August 1987. The UST were removed in February 1988. Measurable thickness of free product has been detected in MW3 on three separate monitoring events. But, measurable free product thickness' have not been detected at the site since September 17, 1990.
- In May 1991 three additional wells (MW5, 6, & 7) and two borings (B8 & 9) were drilled. Hydrocarbons were detected in soil samples collected during the drilling of the borings and wells. Dissolved hydrocarbons were detected in MW6. Several well samples were analyzed for the presence of MTBE in 1992. Up to 1400 ppb was detected.
- The installation of the remediation system was completed by the end of December 1992 and operational by February 1993.
- Quarterly MTBE testing began on 1/5/96 with high levels of MTBE present in MW1, 2, 3, & 7 and RW1.
- The highest and current level of MTBE is on 3/24/98 of 72,000 ppb in GW in MW2 (in the tank pit area).

- The ground water flow is to the NW.
- Depth to water is 4.98 feet minimum, 18.74 feet maximum, and currently 6.84 feet.

Action:
None at this time

Conclusion:

- All of the system components could not be verified.
- The site inspection did not reveal any obvious leaks. However, it does not appear that the trench is being properly monitored.
- Contaminant concentrations indicate that there may be two source locations. Current isoconcentration contours depict the UST area as the most likely source. Since the trench system likely drains back to the tank area it is not possible to conclude that the tanks themselves are a source of a recent release. 1988 concentrations depict one of the fueling islands as a likely source area.
- MTBE concentration trends indicate that a gasoline release has occurred since the current UST system was installed in 1988.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: single wall FRP (1 Regular @ 12,000, 1 Premium @ 10,000, 1 Plus unleaded @ 6,000, 1 DW FRP waste oil @ 1,000) installed in 1/1/83
Piping: Fibertrench installed 1/1/83
Dispenser Containment: no, currently installing
Sump: yes, part of the fiber trench system
Spill: yes
Overfill: no
Striker Plate: unknown, type unknown
Vapor Recovery: Vaporvac

Compliance Monitoring:

- The tank is monitored with an ATG, Veeder Root TLS-250
- The piping is listed as a lined trench and seems to be monitored as a double wall system. The monitoring for the secondary space, the trench, is listed as Red Jacket PPM 2000 which is not in the LG113. A MLLD Red Jacket XLD monitors the primary piping. The system is said to have auto shutdown. Since this is a double wall system it needs to be monitored as such and need sensors in the trenches. The notes from the file indicate that it may have sump sensors. There appears to be an on going problem with water in the piping trenches at this site. There are records of numerous sightings for water in the trenches and sensors that are not working.
- There is a URF on file for a structural failure of the waste oil tank on 3/31/89. The files indicate that there was a waste oil tank removed on 12/8/88.
- Water in sumps and in alarm on 7/7/95.
- Piping tightness test was done 6/12//95 by Tanknology and passed
- Based on Local Agency records, Red Jacket leak detectors failed in 1994 and 1995. The site has also been found to be in alarm on several inspections. The alarm condition was presumably due to water infiltration in sumps and lined trenches.

Site Visit on 9/18/98

- When the team arrived the station was in the process of making upgrades that were not required under the 1998 deadline. This made it difficult to assess the system.
- Turbine sumps and dispenser pans, separate from the trench system, were being installed.
- The tank top fittings were corroded. This follows when considering there is a water intrusion problem at the site.
- No evidence of monitoring for the trench system was found during the inspection.

Site Investigation:

- Site investigation appears to have begun at this site due to the removal of a waste oil tank in late 1988. An URF was issued for the waste oil tank on 6/16/89. A gasoline release has never been reported.
- In March 1989 a soil vapor survey was conducted. The contractor determined that the isoconcentration contours depicted two release areas: north of the westerly pump island (upgradient of RW-1) and between the tank and eastern pump islands (upgradient of MW-1).
- Three groundwater monitoring wells were installed in January 1990. Up to 10 ppb benzene was detected in groundwater during the first sample event. However, free product was detected in MW-1 in August 1992. TPHG and benzene concentrations in the source area wells continue to be elevated.
- The first MTBE analyses were conducted in November 1993. 10,000 ppb MTBE was detected in RW-1.
- Records indicate that regular testing for MTBE began on 5/23/95 with MTBE present in MW1, 2, 3, 4, 6 & 7 and RW1 up to 20,000 ppb in MW-1.

- The highest and current level of MTBE is on 8/8/97 of 120,000 ppb in RW1 (dispenser island area). High BTEX and TPH levels are also present in the well.
- The ground water flow is to the NW at a gradient of 0.0100 on 11/24/97.

Action:
None at this time

Conclusion:
- This site appeared to meet the 1998 deadline standards except for the overfill device. The current upgrade of dispenser containment is not required under the 1998 deadline
- The team had no means of evaluating the tanks at this site.
- It is difficult to determine if the trenches or the rest of the UST system were being properly monitored.
- The facility has had repeated problems with monitoring equipment and water intrusion into sumps and trenches. This is be an installation, monitoring, and an enforcement issue.
- Based on contaminant trends and inspection records it appears that a gasoline release has occurred from the system in use from 1983 to 1998 and was not detected or reported.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP (1@ 10,000, 2@ 8,000, 1@ 1,000) installed in 1/1/96
Piping: Double wall FRP installed 1/1/96
Dispenser Containment: yes
Sump: yes
Spill: yes
Overfill: yes
Striker Plate: unknown
Vapor Recovery: type unknown

Compliance Monitoring:

- The tank is monitored with a Veeder Root TLS-350
- Piping tightness test was done 12/1/97 by Triangle Environmental and passed

Site Visit on 9/17/98

- This site appeared to be a model site with all of the 1998 required upgrades in place. The following observations were made during the site visit:
- An active dispenser leak that was being captured by the dispenser pan was discovered during the visit.
- The power light on the TLS was burned out. It was replaced during the inspection.

Site Investigation:

- Tanks replaced in July 1985, free product observed in tank pit.
- Seven monitoring wells were installed between 1986 and 1989.
- Groundwater monitoring began in 1986. Between 25,000 ppb and 50,000 ppb TPHG and 4200 to 13,000 ppb benzene were detected in MW-1, 2 and 3. Benzene concentrations have reduced significantly since then. However, TPHG concentrations remain within historic ranges in MW-2 and MW-3.
- MTBE analyses began in 1993 in most wells. The highest concentration detected in 1993 was 23,000 ppb in MW-3. Concentrations in this well have remained within historic ranges. MW-1 has contained less than 1000 ppb except for one event. Concentrations in MW-2 increased by an order magnitude from 1993 (3600 ppb) to 1995 (20,000 ppb) to a high of 24,000 ppb in 1996. The highest concentration of MTBE detected at the site was 54,000 ppb in MW-6 in November 1995. Concentrations of MTBE in MW-6 remained above 10,000 until the last monitoring event in July 1998 when a low of 150 ppb was detected.
- URF filed on 2/5/96 during the removal of piping the contamination was found.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- The site inspection revealed a dispenser leak that was captured by the dispenser containment. However, it is unclear whether the dispenser was being properly monitored or if the leak was detected by the monitoring system prior to the inspection.

- There is no evidence of a release to the environment from the current system. There is evidence that a release occurred from the previous piping system. It is likely that the release was stopped when the piping was replaced in 1996.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP (3@ 10,000) Xerxes installed in 12/1/95
Piping: Double wall, FRP, A o Smith
Dispenser Containment: Yes, Brovo Box
Sump: yes, fiberglass and
Spill: yes, 25 gallon fiberglass
Overfill: yes, drop tube
Striker Plate: assume yes because of the age the tank
Vapor Recovery: *type unknown*

Compliance Monitoring:

- Last tank test was done at installation
- Tank is monitored using a Veeder Root TLS 350 and appears to be functioning properly.
- Piping is monitored with a sump sensors and Red Jacket FX2V

Site Visit on 9/18/98

- The facility is very well maintained.
- The sumps were well constructed and appear to drain well around the collar into the backfill with no liquid present in the sumps.
- The dispenser pans are all dry and there is no evidence of leaking.

Site Investigation:

- Four monitoring wells were installed in 1995 as part of a site assessment
- URF was filed on 1/23/96 when contamination was detected during tank replacement. Up to 3800 ppm TPHG was detected in soil.
- The highest concentrations detected in groundwater in 1995 were 80,000 ppb TPHG and 6900 ppb benzene in MW-2 (destroyed '95). TPHG concentrations in wells MW-3, MW-4 and MW-5 have remained around 1000 ppb or less except at MW-5 and benzene has been below 100 ppb except at MW-5 during 3 events. TPHG and benzene concentrations are generally declining.
- MTBE analyses have been conducted since the monitoring wells were installed. The highest concentration was detected in MW-2 at 21,000 ppb. MTBE concentrations in MW-3 and MW-4 have fluctuated, but have remained within historic ranges except for a recent decline which was most significant in MW-4. MTBE concentrations were also declining in MW-5 until the most recent event. A verbal report indicates that concentrations in MW-5 have risen from a few hundred ppb to 18,000 ppb MTBE. In addition, 5500 ppb TAME was detected in this well during the last event. TAME was also detected at 140 ppb and 38 ppb in MW-3 and MW-4 respectively.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- The inspection did not reveal any evidence of a current or recent release from the current 1998 compliant system.
- Until the most recent monitoring event it appeared that the release from the previous UST system (last operated by Exxon) was the source of MTBE, since most wells showed declining concentrations of

most contaminants. However, due to the sudden spike of MTBE and the high detection of TAME (A Chevron exclusive product) it appears that a release has occurred since the new system was installed.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FRP clad (1@ 12,000, 1 @ 7,000, 1 @5,000) Modern Welding stalled in 3/31/97.
Piping: Double wall flex (Enviroflex) installed 3/31/97.
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: yes, *type unknown*
Striker Plate: yes
Vapor Recovery: Stage I - Dual, Stage II - Balanced

Compliance Monitoring:

- The tank is monitored with an interstitial sensor and EBW Autostick II
- There are no records of a tank test for the new system.

Site Visit on 9/16/98

- This site appeared to be a model site with all of the required 1998 upgrades in place. The following observations were made during the site visit:
- A 60% LEL was noted in the unleaded annular, while a 20% LEL was noted in the split tank annular.
- No other problems were noted with any of the other components inspected during our visit.

Site Investigation:

- There is a URF for a release discovered on 7/20/83 due to contamination detected during installation of ten groundwater monitoring wells and was attributed to structural failure of a tank.
- Free product was measured periodically beginning in 1983.
- In 1994 a soil vapor and free product removal system was operated
- In May 1996 the USTs, piping and dispensers were removed. Over 1000 cubic yards of soil was over-excavated. Up to 5.8 ppm MTBE was detected in the verification soil samples.
- Monitoring for MTBE began in some wells in October 1996. 4000 ppb MTBE was detected in one well (B-7). Since then, two quarters of MTBE sampling has been conducted for most wells. The site has a high MTBE level of 29,000 ppb in MW5 on 8/14/97, method 8240 used for analysis. No sample results have been provided since. Analytical data from 1993 to present indicates that benzene levels continue to be high in many wells.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements
- The team had no means of evaluating the tanks at this site.
- There was no evidence discovered during the inspection that a release to the environment from the current system has occurred. However, high LEL levels were observed in the interstitial space of the tanks. The cause of these high LEL levels is unknown.

It is likely that the MTBE contamination is a result from a release from the previous system.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, wet wall, FRP (3@ 10,000) Owens Corning installed in 1985
Piping: Double wall system, fiber trench installed in 1985
Dispenser Containment: none (unless the trench system was extended to include the dispenser area) although the site is scheduled to have dispensers installed in October.
Sump: yes but not attached to the tank (dirt, water, and product in sight), corrugated metal drainpipe
Spill: yes, 5 gallon metal not cathodically protected
Overfill: Yes, drop tube
Striker Plate: assume yes because of the age the tank
Vapor Recovery: Balance

Compliance Monitoring:

- The piping is being monitored with sensors placed along the trench and a Veeder Root WPLLD on the FRP.
- The tank is wet wall with the old Ping-Pong balls that will need to be replaced.
- Piping tightness test was done 4/2/98 by NDE and passed

Site Visit on 9/18/98

- There is a fiber trench system at this site and therefore many unknowns when it comes to determining the status of the system. It is impossible to tell from a visual inspection of the sump if the trench is fiberglassed to the outside of the sump. Likewise, it is impossible to tell how far under the dispenser the trench extends. Most facilities and local agencies do not have as built plans available for inspection.
- At this facility the sump is made of a metal corrugated drainpipe and the trench is most likely not fiberglassed to it. Although the system could be engineered to drain to another point it is impossible to tell at this time. The trench is monitored with float sensors and the site has had ongoing problems with water getting in to the trench system.
- From observation this system meets the requirements for an upgraded system except that the spill buckets and sumps are not cathodically protected. Even so, the site is experiencing an ongoing leak from the system.
- One location where the system was leaking, at the time of our site visit, was the piping under a dispenser. The piping was wet and the gravel underneath is visibly stained. If this is a truly a secondarily contained system the leak should have been detected by the trench sensors.
- The owner of the station, Equilon, intends to abandon their trench system because of problems experienced due to infiltration of water.
- Due to the use of a Veeder Root Simplicity Communication System in use at the site it was impossible to check alarm history, only inventory was available at the time.

Site Investigation:

- Spill Report Form filed on 2/12/86 based on soil contamination detected at the time of tank removal.
- URF was filed for a release on 10/2/86. The cause of the leak was a structural failure. The tanks were reportedly installed on 1/1/86.
- A groundwater monitoring well (MW-1) appears to have been installed in 1985 or 1986. Two groundwater-monitoring wells were also installed in 1989. However, groundwater-monitoring records don't begin until the first quarter of 1990.
- TPHG concentrations were below 1000 ppb until 1993, when they increase to concentrations in excess of 10,000 ppb in MW-1. The highest concentration of TPHG was detected in 1996 at 78,000 ppb.

While there appears to be some correlation between TPHG (and benzene) concentrations and groundwater elevations, one of the lowest concentrations detected (1992) was from the same groundwater elevation as that of the highest concentration detected in 1996.

- MTBE testing began on 7/17/96 with 48,000 ppb of MTBE present in MW1. The highest and current level of MTBE is on 4/6/98 of 280,000 ppb in GW.
- The results of a soil and water investigation performed in April 1998 indicate that the soil down gradient of the UST system contained MTBE and very little TPHG or benzene. The highest concentration of TPHG and benzene in groundwater were detected upgradient of the tanks, but down-gradient of the dispensers. The consultant has suggested that based the results of the investigation there appears to be two separate releases.
- The ground water flow is to the NW at a gradient of 0.0090.
- Depth to water is 7.1 feet minimum, 17.91 feet maximum, and currently 7.68 feet. However, groundwater elevations in MW-1 have not exceeded 5 feet of change in over 7 years of gauging.

Action:

None at this time

Conclusion:

- On paper, the site meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- Under the current regulations, this facility is not required to have dispenser containment and it is not known if the trench is protecting this area.
- It appears from the site inspection and investigation results that there has been a release from the nominally 1998 compliant UST system. The dispenser piping may be one of the release sources. However, the release was not apparently detected by the monitoring system.
- The recent or ongoing leak at the station indicates one of three possibilities: 1) the trench does not extend underneath the dispenser area; 2) the trench does extend under the area but is not product tight and the gasoline is escaping into the environment, or 3) the trench does extend underneath the area but the leak is not large enough to be picked up by the leak detection equipment.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad (2@ 12,000, 1@ 520) Modern Welding installed in 1/2/90
Piping: Fiber trench system installed 1990
Dispenser Containment: none
Sump: yes, fiberglass
Spill: yes, steel but not in contact with the backfill.
Overfill: yes, drop tube
Striker Plate: A reference indicates that Modern Welding did not install striker plates in their tanks until 8/90. Apparently this tank was not manufactured with one and may need to have one installed to meet the upgrade requirements.
Vapor Recovery: type unknown

Compliance Monitoring:

- The tank is monitored with a Universal Sensor Devices, Inc. LA-08 Piping tightness test was done 4/26/96
- This site has fiber trench and seems to be monitored as a double wall system with a sump sensor and mechanical line leak detectors (Vaporless LD2000).
- The monitoring system at this site is not functional.
- There is no emergency shut off.

Site Visit (9/18/98)

- According to the local agency, the facility had not been operating since 1996. When the team arrived, the station appeared to be reopened although the operator/owner had not contacted the local agency to do so. It also appears as if work has been done at this site although the local agency had not been notified. This would mean that the repairs or upgrades have not been verified or inspected by the local agency.
- There is a fiber trench system at this site and therefore many unknowns when it comes to determining the status of the system. It is impossible to tell from a visual inspection of the sump if the trench is fiberglassed to the outside of the sump. Likewise, it is impossible to tell how far under the dispenser the trench extends. Most facilities and local agencies do not have as built plans available for inspection.

The following are the observations from the site visit:

- In the regular sump:
  - There was no cap on the sump.
  - It was impossible to tell whether the trench terminated in the sump. The penetrations were sealed so it is assumed that the intention is not to have the trench drain into the sump.
  - The sump sensor was not functioning.
- In the super sump:
  - The sump is not sealed at the penetrations and very clean looking pea gravel is in the bottom of the sump. It looked is if work had recently been done on the sump.
  - Again it was impossible to verify that the trench was connected to the sump where monitoring would take place.
- The dispenser area was a source of concern. The piping was leaking above the shear valve and there are oil filters sitting upside down in the backfill.
- The team was unable to verify how far the trench system extended and if the dispenser area was protected

Site Investigation:

- URF was filed for a release on 2/6/85. The cause of the leak was a structural failure discovered at the tank closure.(Agency records indicate that leak was discovered during pump island work and product was detected in soil).
- URF filed 3/7/90. Filed based on contamination discovered at time of tank removal. In addition, 50 gallons of product was spilled when a fiberglass tank ruptured upon removal. Significant concentrations of petroleum hydrocarbons were detected at 14' and 21' below ground surface (bgs) in soil. However, three soil borings drilled at the tank pit 3 months later did not detect any significant concentrations until approximately 30' bgs, indicating that an older release may have migrated through the permeable soils from 10' to 30' bgs.
- Groundwater was not encountered in borings drilled to a maximum depth of 80' bgs in 1990 or 1991. However, groundwater was encountered in 1992. Grab groundwater samples were collected during drilling and contained up to 29,000 ppb TPHG and 1100 ppb benzene.
- Vapor extraction wells were installed in 1994. Groundwater samples were collected from these wells and contained up to 69,000 ppb TPHG and 13,000 ppb benzene.
- Regular monitoring of the wells did not begin until 1997 and is being conducted semiannually. TPHG and benzene concentrations remain high in the source area wells. BTEX and TPHG were all high during the 4/18/97 and 9/19/97 reports. The highest TPH was 100,000 ppb on 9/19/97 but is currently 81,000 ppb. The highest Benzene was 13,000 ppb on 7/17/94 but is currently 9,600 ppb.
- MTBE was first detected, but not quantified, in well PMW4 in November 1995. MTBE concentrations in VE2 increased by an order of magnitude between September 1997 and March 1998 sampling events. The highest and current level of MTBE is 73,000 ppb detected on 6/1/98 in VE-2. The MTBE concentrations in the other source area well (VE-1) have remained above 30,000 ppb since April 1997. Increasing concentrations are also being observed in PMW-4 near the dispensers.
- Depth to water is 33.91 feet minimum, 38.2 feet maximum, and currently 33.96 feet.
- A report suggests that there does not appear to be a correlation between ground water levels and MTBE concentrations, however, there are relatively fewer MTBE analyses than ground water monitoring data.
- A source area investigation was performed in October 1998. The only soil contamination detected above a depth of 30 feet was located approximately 30 feet from the dispensers and USTs. A site plan depicting the product line locations was not available. It is possible that this soil sample location is near a bend in a product line. However, significant contamination was not detected.

Action:

None at this time

Conclusion:

- This site meets the 1998 deadline standards
- It is difficult to determine if the trenches or the rest of the UST system are being properly monitored.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- There was a leak observed in the dispenser. It is difficult to determine whether dispenser pans are present to capture and detect a release.
- Based on site observations there is potential for releases to go undetected. However, based on the recent soil investigation, there is no evidence of a ongoing or recent release from the current compliant UST system.
- The source of increasing MTBE concentrations in groundwater appears to be from trapped residual contamination in soil at 30 to 35 feet, probably from a release from the previous UST system.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FRP clad (1@ 12,000, 2@ 10,000, 1@ 520) Modern Welding stalled in 1/1/87
Piping: Double wall FRP installed 1994 (replaced the fibertrench)
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: yes, *type unknown*
Striker Plate: yes
Vapor Recovery: Stage I - Dual, Stage II - Balanced

Compliance Monitoring:

- The tank is monitored with a Veeder Root TLS-350. The TLS-350 did not have a printer so none of the monitoring history for the site could be determined
- Maintenance equipment check was done 9/10/96 by Triangle Environmental and passed interstitial sensors, vapor recovery, and MLLD.

Site Visit on 9/16/9

This site appeared to be a model station with all of the 1998 required upgrades in place. The following observations were made during the site visit:

- There was liquid, presumably water, in both of the gasoline STP sumps that had been left from failed lake tests performed on both sumps the previous week by an outside contractor.
- The sump probes had been raised up to keep them out of alarm and were still in that position during our inspection.
- 10% LEL reading in the diesel annular. The cover for the super annular was frozen and could not be removed for testing purposes.

Site Investigation:

1987 - piping replaced with fiber line trenches - no release detected
1987 - 1 double walled tank installed (premium)
1990 - 2 tanks replaced with double walled tanks- up to 0.13 ppb benzene in soil beneath former tanks.
1991 - case closed
1994 - piping replaced with double walled/ No soil samples per LA

- URF filed on 1/20/98 as a result of subsurface investigation conducted in response to detection of MTBE in a nearby municipal supply well. New case opened.
- High MTBE concentration 140,000 ppb in February 1998 at MW-6 at the north end of the tank pit. Concentrations have declined to 11,000 ppb in August 1998 at MW-6. The monitoring well is now connected to remediation system and is no longer monitored. MTBE concentrations in MW-5 on the south end of the tank pit have increased from 20,000 ppb in March 1998 to 120,000 ppb in August 1998. This well was also connected to the remediation system. Some benzene and TPHG have been detected in these wells, up to 610 ppb and 740 ppb, respectively. Most other wells have MTBE only contamination.
- Significant concentrations of MTBE were also detected in soil (up to 100 ppm) around the tank pit in 1998 and little to no TPHG or BTEX.
- A soil vapor extraction system was started in May 1998 and may be assisting in lowering concentrations in some of the wells. Over 1500 lbs of MTBE as vapor have been removed. In addition, a groundwater extraction system has also been started at the site.

Action:
None at this time

Conclusion:
- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- There was no evidence of a current or recent release at the time of inspection. However, it appears that the sumps may not be liquid tight.
- Based on the system upgrade history and investigation results it appears that a release from the upgrade compliant system has occurred and gone undetected. It is possible that the release occurred while the fibertrench system was in use. However, the significant amount of MTBE removed by the remediation system indicates that a more recent release may have occurred.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP clad steel (2@ 12,000) Modern Welding installed in 12/1/89
Piping: Double wall FRP installed on 12/1/89, *type unknown*
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: Yes, *type unknown*
Striker Plate: *unknown*
Vapor Recovery: *type unknown*

Compliance Monitoring:

- DW system is monitored with a Veeder Root TLS-350
- Piping is also equipped with a Red Jacket MLLD.
- System has auto shutdown (not *confirmed).*
- Piping tightness test was done 1/8/98 by Triangle Environmental, Inc. and passed.

Site Visit on 9/17/98

- This site appeared to be a model site with all of the 1998 required upgrades in place. The following observations were made during the site visit:
- The LEL of both annular spaces was well over the 100% level.
- There was liquid in the super STP sump and the probe had been raised up above the height of the liquid.
- The power light on the TLS was burned out. We replaced it during the inspection

Site Investigation:

- URF was filed for a release on 12/4/89. The cause of the leak was a structural failure and this was discovered at the time of removal of the old tanks.
- Three groundwater monitoring wells were installed in July 1990. Three additional wells were installed in December 1990. In 1992, the last three 2 wells were installed.
- Groundwater monitoring records begin in the third quarter of 1990.
- TPHG and benzene concentrations increased significantly within the first few sampling events. By June of 1992, TPHG concentrations had increased to 51,000 ppb and benzene up to 6600 ppb in MW-2 near the tank field. The source area wells depict steady TPH concentrations over time. Slightly increasing trend is seen with benzene concentrations in the two source wells (MW-2 and MW-3).
- MTBE testing began in April 1996 with MTBE present in MW1, 2, 3, 4, 5, & 6. (The laboratory noted the presence of MTBE as early as September 1995, but it was not quantified). Up to 290 ppb was detected when MTBE testing began in April 1996. Within two quarters, MTBE concentrations near the tank increased to 33,000 ppb. MTBE concentrations in the other wells have remained below 1000 ppb.
- The highest and current level of MTBE is on 6/30/98 of 75,000 ppb in MW3 (tank pit area), 8260 was used to confirm. Elevated concentrations of BTEX and TPH are present and within historic ranges.
- The ground water flow is to the south at a gradient of 0.002. The groundwater gradient has been primarily south to southwest. The groundwater elevations in MW-3 have risen 10 feet since groundwater monitoring began. However, there are no observed correlation between depth to water and concentrations except for MTBE concentrations in MW-6 appear to be inversely related. In addition, an inverse correlation can also be observed between elevations in MW2 and MW-5 relative to TPH concentrations.

Appendix II

Site Information

Action:
None at this time

Conclusion:
- The site meets the 1998 upgrade requirements.
- The inspection results (high LEL and liquid in sumps) indicate the system may not be operating as designed.
- The team had no means of evaluating the tanks at this site.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- The subsurface monitoring data indicates that residual contamination from the release reported in 1989 has not been removed, resulting in continued high TPHG concentrations. The increases in MTBE concentrations would indicate that a more recent release from the upgrade compliant system has also occurred.

Site Information

January 1999

	Local Agency	Other Contaminents Present	Contaminent Trend	Trend Time (quarters)	Current MTBE (ppb)	Current Date	Current Source	High MTBE (ppb)	High Date	High Source	Analytical Test Method
1	El Dorado	yes	increasing	5	2,084	4/2/98	GW	2,084	4/2/98	GW	NA
2	El Dorado	yes	None	0	212	8/28/98	GW in MW-2	2121	8/28/98	GW in MW-2	8260
3	El Dorado	some at GPT13-10 in soil	None	0	3900	6/1/98	GW	3900	6/1/98	GW	8260
4	El Dorado	None	None	0	180	2/1/98	soil	410	3/1/98	GW	8240 for soil
5	El Dorado	yes, but not in all wells	Not clear, remediation w/hydrogen peroxide was use	0	89,000	6/26/98	GW	89,000	6/26/98	GW	8260

Dispenser Containment Dispenser Leaks	Sump Containment Sump Leaks	Secondary Containment Material Secondary Contaiment Leaks	Single Walled Piping Material Single Walled Piping Leaks
Y Brovo Box, water in the dispenser area, float switches not working	Y Yes, water in the sumps and sensors pulled up	FRP	
Y	Y None visable	flex	
Y leak in piping under disp.and in flex con., liquid in the diesel dispenser	Y Yes, penitration fitting incorrectly installed	corrogated with clamps yes, product in the sumps and none in one that had a primary leak	
Y WF deep box, seeping and leaking evident from varnished piping	Y none apparent	FRP none apparent	
Y boxes showed evidence of past leaks, piping varnished	Y Yes, water and product in the sumps & sensors pulled up	Total Containment	

	Local Agency	Other Contaminents Present	Contaminent Trend	Trend Time (quarters)	Current MTBE (ppb)	Current Date	Current Source	High MTBE (ppb)	High Date	High Source	Analytical Test Method
6	El Dorado	yes in some wells	NA	0	839	8/12/98	Total purgable	1,600	9/25/97	GW	8260
7	El Dorado	Yes, there is floating product in the recovery well (9.25') and in the monitoring wells.	Increasing in some and not in others, remediation at site	0	1,230,000	4/18/98	GW in RW-1	1,230,000	4/18/98	GW in RW-1	NA
8	San Jose Fire	VE wells have other constituents but not the GW MWs.	increasing	2	15	9/19/98	GW	VE-2 73,000, V	9/19/98	Vapor extraction well	8020
9	San Jose Fire	yes, in MW-3&5 near the tank and dispensers.	decreasing although last month up	6	2,000	5/11/98	GW	21,000	5/31/95	GW for MW-2, destroyed on 7/17/95	NA
10	San Jose Fire	yes, benzene	increasing	4	250,000	4/6/98	GW	280,000	4/6/98	GW	NA

Dispenser Containment Dispenser Leaks	Sump Containment Sump Leaks	Secondary Containment Material Secondary Containment Leaks	Single Walled Piping Material Single Walled Piping Leaks
N Area under one dispenser was contaminated	N Yes, area around turbines was heavily contaminated		
N Piping under dispenser was stained.	Y Yes, lquid in sumps & sensors pulled up.	FRP Secondary not visable from dispenser end	
N Piping leaking above shear valve, filters turned upside down draining	Y one sump had penitrations sealed so trench could not drain, sensors not functional	trench dry, system not in use	
Y none visable	Y none visable	FRP	
N one dispenser was leaking	Y Yes, corrogated metal drain pipe not attached to the tank, strong odor	FRP trench possibly from the trench	

	Local Agency	Other Contaminents Present	Contaminent Trend	Trend Time (quarters)	Current MTBE (ppb)	Current Date	Current Source	High MTBE (ppb)	High Date	High Source	Analytical Test Method
11	San Jose Fire	yes, all constituents	decreasing	3	54,000	2/13/98	GW in recovery well-1	120,000	8/8/97	GW in recovery well-1	8020
12	San Jose Fire	yes	many peaks	10	110,000	6/25/98	GP-1 at a depth of 9', leading edge of the plume	110,000	6/25/98	GP-1 at a depth of 9'	602
13	San Jose Fire	yes, Benzene	increasing 3 decreasing 1	0	75,000	6/30/98	GW in MW-3	75,000	6/30/98	GW in MW-3	8260
14	San Jose Fire	yes, all other constiturents present	None	0	29,00	8/14/97	GW in MW-5	29,000	8/14/98	GW in MW-5	8240
15	San Jose Fire	NO	None	0	2,100	5/20/98	Soil boring by GP-21 at 34'	140,000	2/17/98	GW in MW-6, B-5 (soil boring)	8260

Dispenser Containment Dispenser Leaks	Sump Containment Sump Leaks	Secondary Containment Material Secondary Containment Leaks	Single Walled Piping Material Single Walled Piping Leaks
N yes , an actual leak was seen at the time of instpection, wet piping.	N		
N None reported by the team inspector	N None reported by the team inspector	none reported	
N	Y Yes, liquid in sumps & sensors pulled up.	FRP	
N	Y None apparent	flex piping	
N	Y Yes, liquid in sumps & sensors pulled up	FRP	

	Local Agency	Other Contaminents Present	Contaminent Trend	Trend Time (quarters)	Current MTBE (ppb)	Current Date	Current Source	High MTBE (ppb)	High Date	High Source	Analytical Test Method
16	San Jose Fire	Yes	decreasing	4	32,000	4/19/98	GW in MW-6	73,000	5/26/94	GW in RW-1	8020/8260 lists
17	Sacramento Co	N/A	None	0	4,700	1/1/98	GW at a depth of 18.11 feet	4,700	1/1/98	GW at a depth of 18.11 feet	8020
18	Sacramento Co	yes	none	0	57,000	6/2/98	GW in MW3 adjacent to dispenser island	57,000	6/2/98	GW in MW3 adjacent to dispenser island	8020
19	Sacramento Co.	only in MW2 - TPH-g and BTEX	increasing	3	7,900	6/11/98	GW in MW2 down gradient from the tanks	7,900	6/11/98	GW in MW2 down gradient from the tanks	8020
21	El Dorado	NA	None	0	NA	10/21/98	NA		10/21/98		NA

Dispenser Containment Dispenser Leaks	Sump Containment Sump Leaks	Secondary Containment Material Secondary Contaiment Leaks	Single Walled Piping Material Single Walled Piping Leaks
Y Yes, discovered at the time of the visit, captured by the dispenser pan	Y none reported	FRP none reported	
N	Y Not liquid tight	None None	2-FRP & steel unions, piping was installed without adequate epoxy, silicon, and non compatible epoxy Yes, confirmed by soil testing at the site
N	N	none none	a combination of AO Smith, Ameron, and steel unions joined with inadequate or incorrect epoxy Yes increasing levels of MTBE at the site
Y no sensosr in the dispenser pans, piping was stained	Y no visible leaks	FRP none visible	
N	N		FRP yes, catastrophic at the time of upgrade work

	Local Agency	Other Contaminents Present	Contaminent Trend	Trend Time (quarters)	Current MTBE (ppb)	Current Date	Current Source	High MTBE (ppb)	High Date	High Source	Analytical Test Method
22	Sacramento Co.	yes, TPPH & BTEX	None	0	160,000	5/14/98	soil at depth of 4.5 feet at the piping connection	160,00	5/14/98		8260
23	Tehama Co.	TPH diesel	decreasing	3	2,700	11/21/97	GW in MW-2S	13,000	3/11/97	GW in MW-2S near product lines	8260

Dispenser Containment Dispenser Leaks	Sump Containment Sump Leaks	Secondary Containment Material Secondary Containment Leaks	Single Walled Piping Material Single Walled Piping Leaks
N Yes, 120,000 ppb under one of the dispensers	N did not sample		steel unions along with FRP from two different manufacturers w/non compatible epoxy. Yes, at dispenser and piping run.
Y there is a high level, peaked at 800 ppb in MW-6s near dispensers	Y yes, water and product where visible in the sumps at the time of the inspection & sensors pulled up.	FRP apparently in the piping where the secondary was terminated in a sump.	

Underground Economy, as defined in Section 329 of the Unemployment Insurance Code, to issue citations pursuant to Sections 226.4 and 1022 and issue and serve a penalty assessment order pursuant to subdivision (a) of Section 3722.

(b) No employees shall issue citations or penalty assessment orders pursuant to this section unless they have been specifically designated, authorized, and trained by the Labor Commissioner for this purpose. Appeals of all citations or penalty assessment orders shall follow the procedures prescribed in Section 226.5, 1023, or 3725, whichever is applicable.

(c) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2006, deletes or extends that date.

(Added by Stats. 1994, Chapter 1117 (SB 1490), operative until January 1, 2000; Amended by Stats. 1999, Chapter 306 (SB 319).)

Computerized Enforcement Tracking System for Consumer Complaints

7020. The board shall maintain a computerized enforcement tracking system for consumer complaints.

(Amended by Stats. 1991, Chapter 1160 (AB 2190).)

Article 2. Application of Chapter

"Person" Defined

7025. "Person" as used in this chapter includes an individual, a firm, copartnership, corporation, association or other organization, or any combination of any thereof.

"Contractor" Defined

7026. "Contractor," for the purposes of this chapter, is synonymous with "builder" and, within the meaning of this chapter, a contractor is any person, who undertakes to or offers to undertake to, or purports to have the capacity to undertake to, or submits a bid to, or does himself or by or through others, construct, alter, repair, add to, subtract from, improve, move, wreck or demolish any building, highway, road, parking facility, railroad, excavation or other structure, project, development or improvement, or to do any part thereof, including the erection of scaffolding or other structures or works in connection therewith, or the cleaning of grounds or structures in connection therewith, or the preparation and removal of roadway construction zones, lane closures, flagging,

F. PRE-NPRM COMMENTS

Allan

State Water Resources Control Board

Winston H. Hickox
Secretary for
Environmental
Protection

Division of Clean Water Programs
2014 T Street • Sacramento, California 95814 • (916) 227-4377
Mailing Address: P.O. Box 944212 • Sacramento, California • 94244-2120
FAX (916) 227-4349 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

OCT 13 1999

Interested Parties

STAFF LEVEL PUBLIC HEARING REGARDING ENHANCED LEAK DETECTION OR MONITORING FOR UST'S WITH A SINGLE WALLED COMPONENT

Senate Bill 989 was recently signed by Governor Davis and will become law on January 1, 2000. Included in this bill is a provision that owners and operators of underground storage tank systems with a single-walled component, that are located within 1,000 ft of a public drinking water well, must conduct enhanced leak detection or monitoring for these systems on or after November 1, 2000. Enhanced leak detection/monitoring is that monitoring which is in addition to the current monitoring requirements established in individual tank operating permits (i.e. SIR, ATG, LLD, tank/pipe integrity testing, etc.) This additional monitoring may include more frequent events of currently required monitoring techniques, or may consist of external monitoring such as soil and ground water investigations, tracer tests, video camera inspections, etc.

Prior to adopting regulations to implement this enhanced leak detection/monitoring program the State Water Resources Control Board (SWRCB) must consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures for enhanced leak detection. To this end, the SWRCB has scheduled a staff level public hearing for **10 a.m. to 4 p.m. October 28, 1999 at the SWRCB Board Hearing Room, 901 "P" Street, Sacramento, CA (see attached map).** Interested parties may present comments at this meeting, or may submit written comments to Charles NeSmith, State Water Resources Control Board, Underground Storage Tank Program, P.O. Box 944212, Sacramento, CA, 94244-2120. Please submit written comments by October 26, 1999. A time limit may be imposed on presentations at the hearing in order to allow all participants an opportunity to speak.

If you have any questions regarding this matter, please contact Charles NeSmith at (916) 227-4377.

Sincerely,

Allan Patton, Manager
Underground Storage Tank Program

Enclosure

Enhanced Leak Detection

Name	COMPANY / ADDRESS	PHONE / FAX
Allan Patton	SWRCB 2014 T St, Suite 130 Sacramento, CA 95814	(916) 227-4351 227 4349
Shahla Farahnak	SWRCB	(916) 227-4350 Fax (916) 227 4349
DAVID HOLTRY	SWRCB	916 227-4332
RON WILKNISS	WSPA	818/543-5324 818.545.0954
Jim White	White Environmental Associates	714-529-0682 FAX 529-3679
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James Giannopoulos	SWRCB	916 227 4320
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DAVID ARRIETA	DNA, 1019 11th St. #110 SACTO, 95814	916 666-0568 (F) 925-829-6885
Jennifer Tucker	GHH Engineering 8084 Old Auburn Rd, Ste E Citrus Heights, CA 95610	(916) 723-7645
Valerie Kauffman	El Dorado County Env. Mgmt. Dept	(530) 573-3450

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Chris Pace	8475 Jackson Rd, #230 Sac, CA 95826	875-8457
David Camille Tosco Marketing Co.	2000 Crow Canyon Rd, St. 400 San Ramon, CA 94583	925-277-2335 925-277-2361
RICK STEWARD GLENN COUNTY UST PROGRAM	BOX 351 WILLOWS, CA. 95988	530-934-6500 -6503 (FAX)
WALT GILL - CHEVRON	575 MARKET ST. SAN FRANCISCO, CA 94105	415-894-2663
DON GILSON CHEVRON	575 MARKET ST. SAN FRANCISCO, CA 94105	415-894-1803 Fax -1163
Bob Hart	V-R 125 Powder Forest Dr. Simsbury, CT 06070	(860) 651-2865
Kurt Witzgall	Veeder-Root 125 Powder Forest Dr. ~~Simsbury, CT 06070~~	(860)-651-2754
Randy Smith	Mobil Oil 1201 K. Street #1920 Sacramento, Ca 95814	916-444-2852 fax -7 80655

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	SACRAMENTO, CA	
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CAREN GOZZI-BEVINS	NELLA OIL CO. 2349 RICKENBACKER WY AUBURN CA 95602	530-885-0401 (FAX) 885-5851
Richard Dow	Groundwater Management SW P.O. Box 8400 Mesa, AZ 85214	480 ~~520~~ 926 3000 480 926 0331
Randy Golding Sean Dugan	Tracer Research Corp. 3755 N Business Center Dr Tucson AZ 85705	800-989-9929 FAX 520 293 1306
Bruce Bench	Contra Costa Co Haz mat. 4333 Pacheco Blvd. Martinez	925 646 2286

Alan Fernandes	Nielsen Merksamer et. al.	916/446-6752 (Phone)
	770 L St, Ste 800	916/446-6106 (fax)
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Fax (408) 280-6479	San Jose, CA 95159-8070
Kevin Amick	Shields Harper & Co
916 372-0440	2699 Del Monte.
	W-Sacto CA 95691
James Wilie	California Trucking Association
916 373-3541	3251 Beacon Blvd.
	W. Sac., CA 95691

THE
SOUTHLAND
CORPORATION

November 8, 1999

Mr. Charles NeSmith
State Water Resources Control Board
P.O. Box 944212
Sacramento, CA 94244-2120

RE: ***Senate Bill 989***
Enhanced Leak Detection

Dear Mr. NeSmith:

7-Eleven is submitting comments as they relate to Senate Bill 989 and the provision requiring enhanced leak detection at sites with single wall components and, located within 1000 feet of a public drinking well.

7-Eleven proposes that enhanced leak detection include a comprehensive maintenance program. 7-Eleven's maintenance program consists of contracts with local certified gasoline maintenance contractors. Should any store require gasoline repairs, the site operator calls a toll free dispatch number and orders the repairs. Repairs are prioritized and assigned to the local contractor. Most repairs are made within 24 hours, or less.

A significant part of 7-Eleven's maintenance program is the Gasoline Facility Preventative Maintenance Program. The Program consists of site inspections completed by certified gasoline maintenance contractors every 120 days. The technician completes a comprehensive inspection of the gasoline facility. All of the gasoline equipment at the site is inspected for defects or required repairs. Any needed repairs are completed at that time. Any indications of potential releases or other significant problems are immediately reported to the respective 7-Eleven Maintenance Supervisor, who, in turn, contacts 7-Eleven's Environmental Manager.

In the state of California, 7-Eleven has contracted with two national environmental consulting firms, SECOR International and IT Corporation. Both companies act as agents for 7-Eleven in the assessment and remediation of any release at a 7-Eleven gasoline facility.

To supplement this Preventative Maintenance Program, 7-Eleven recommends that when technicians visit a site to make repairs that may become necessary between the 120-day cycles, the maintenance technician complete a "modified" inspection checklist to ensure that no potential releases have occurred.

In addition, 7-Eleven is in the process of upgrading the existing Tidel Automatic Tank Gauge at every site to a Veederoot TLS-350. The enhanced capabilities of the Veederoot will add to leak detection effectiveness at all sites. We hope to have all stores in California upgraded by the end of 2001. Sites that fall within the 1000-foot radius of drinking water wells will receive priority status for installations.

Environmental Services Department 10220 S.W. Greenburg Road, Suite 470. Portland, Oregon 97223
Phone (503) 977-7713 Fax (503) 245-3438

I would like to participate in any committee involving the petroleum industry on this issue. Should you have any questions, please feel free to call me at (503) 977-7713.

Sincerely,

Bob DeNinno
7-Eleven, Inc.

Mobil Business Resources Corporation

3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929
TELEPHONE (310) 212-2800

November 10, 1999

Mr. Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith:

Mobil offers the following comments in response to the questions and issues which were raised at the October 28, 1999 public hearing regarding enhanced leak detection or monitoring for UST's with a single walled component.

According to SB 989, the requirement for enhanced leak detection/monitoring is triggered by the presence of a single-walled component. Since the cost of enhanced leak detection/monitoring could be significant, it is important that the definition of a single-walled component be carefully crafted to avoid triggering the requirement when there is little or no potential for a significant release to the environment. To that end, we recommend that the definition of single-walled component include only those components from which a liquid product release would directly enter the environment. A component should not be considered single-walled if it is surrounded by secondary containment capable of capturing a product release from the component. Also, enhanced leak detection/monitoring should not be required by a single-walled component which, by nature of its configuration and operating conditions, presents little or no potential for a product release to the environment (e.g. siphon lines).

The enhanced monitoring requirements should not be limited solely to the use of advanced technology. Enhanced monitoring should also include improved or increased usage of current technologies. In general, any monitoring option that exceeds current regulatory requirements should be considered if it can be shown to be cost-effective. Potential options could include reducing the response time to a leak or release. Since Statistical Inventory Reconciliation (SIR) will not detect a leak until potentially many days after the leak has occurred, response time could be significantly reduced by eliminating the SIR option and replacing it with the more direct electronic leak detection systems. Other methods that may reduce response time include remote (3rd party) monitoring and automatic station shutdown upon detection of a fuel leak/release.

The current regulations include definitions related to frequency and sensitivity of the leak detection systems. Due to the potential for additional false alarms, we recommend against increasing the frequency and sensitivity of this equipment.

The SWRCB should take into account all costs associated with the various enhanced monitoring options to determine whether they are cost-effective. Examples of costs that may be significant, but often overlooked, include handling/disposal of test media (e.g. water used in hydraulic testing) and laboratory analysis.

Generally, the cost of compliance is lower when multiple compliance options are available. Therefore, the state board should strive to provide a menu of options for enhanced leak detection/monitoring in lieu of specifying one single method. However, it is crucial that the facility, not the local agency, be allowed to select from the menu of options. As you know, a major difficulty in implementing the 1998 UST upgrade requirements was reaching agreement with the local agencies on the specific requirements. This was a time consuming process due to the large number of local agencies in California ant it vastly increased the complexity of the project, compressed installation schedules and increased the cost of compliance. This situation must be avoided with implementation of the enhanced leak detection/monitoring required by SB 989. SB 989 clearly requires the state board to establish the requirements. This should not be delegated to the local agencies.

We are concerned about implementation timing. By the time the requirements for enhanced leak detection/monitoring are fully defined by the adoption of regulations, significantly less than a year will be available for implementation if full implementation is required by November 1, 2000. This would not leave a sufficient period of time for the necessary engineering, procurement and installation of additional monitoring equipment. Further constraining the implementation schedule is the lack of precise information regarding the location of water wells. A considerable amount of time may be required to accurately identify those service stations located within 1000 feet of a public drinking water well. Therefore, we strongly encourage the SWRCB allow facilities to submit compliance plans by November 1, 2000 including a reasonable implementation schedule in lieu of achieving full compliance. If SB 989 does not allow this flexibility, then the requirements adopted by the SWRCB must be selected based on feasibility of implementing them by November 1, 2000.

Very truly yours,

SR Holm

Stan Holm
Regulatory Issues Manager
Mobil Business Resources Corporation

Mobil Business Resources Corporation

3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929
TELEPHONE (310) 212-2800

November 10, 1999

Mr. Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

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Very truly yours,

SR Holm

Stan Holm
Regulatory Issues Manager
Mobil Business Resources Corporation

From: "Camille, David:" <dcamille@tosco.com>
To: "'Farahnak, Shahla (SWRCB)'" <Farahnas@gwgate.swrcb.ca.gov>, "'NeSmith, Charles (SWRCB)'" <nesmithc@gwgate.swrcb.ca.gov>
Date: 11/10/99 11:18AM
Subject: FW: Summary of 10/28/99 SWRCB Meetings Regarding SB989 Enhanced Leak Detection

Shahla,

Please forward to Charles NeSmith. I am not sure if I have his correct e-mail address.

Thank you.

David Camille

Charles,

In response to Alan Patton's meeting a week an a half ago, I offer the following comments :

> * What is "a single-walled component" ?
> SW lines, SW tanks - no risers, no sites without dispenser containment
> (since these will be upgraded eventually anyway)
>
> * Should enhanced monitoring take into account the "degree of
> single-walled-ness" or age?
> In reality, age (and type) of tanks/lines should matter. In reality, I
> don't believe the State wants to get into exceptions.
>
> * What about existing technology?
> PLLD is great and should be sufficient. CSLD may be enough for SW tanks.
> Current or existing monitoring wells (external monitoring) may be
> sufficient even though it is an "after-the-fact" detection method.
>
> * What about external monitoring techniques (i.e. monitoring well) ?
> This would be an "after-the-fact" monitoring method that we do not want to
> get involved with unless everyone is required to do it. As long as
> everyone has to comply (even the little guys and school districts and fire
> stations, etc.) there may be support for external monitoring. However it
> should be one well, at least 30 feet from the tank pit (so it is not a
> conduit) directly between the tanks and the drinking water well. More
> wells are not necessary if the worst case assumption is that water flows
> from the site toward the drinking water well.
>
> * Should enhanced monitoring mean increasing the frequency of current
> monitoring techniques, or should additional techniques be required?
> The State is really set on the Tracer method and is not very convinced
> that more frequent monitoring will work. I disagree and believe the more
> frequent monitoring (i.e. visual inspections) could be beneficial. Most
> of the current leaks appear to be at piping connections (under dispensers
> and turbine areas) and surface spills.
>
> * What are some of the specifics of appropriate, cost effective

> enhanced monitoring methods? (Facility down time , costs, feasibility,
> quality of resulting data)
>
> * Should the state prescribe one method for use statewide or a range
> of options from which the local agency could select?
> My guess is that a statewide option is all that will fly given the timing.
> Local idiosyncrasies have always been a challenge and we may not want
> agencies like Long Beach to have the flexibility.
>
> * What does the owner/operator have to do before November 1, 2000?
> Perform basic due diligence to determine if the facility is within 1,000
> feet of a well. Possibly assist the State by providing Lat/Long data of
> our stations. This may prevent inaccurate notifications from the State.
>
> * How should notification from the board occur?
> Certified letter to owner and operator of facility.
>
> * How to determine if facility is within 1,000 feet of a public well?
> State GIS program will be the first pass. Follow-up site specific
> investigations will be necessary for confirmation.
>
> * Can the determination be appealed?
> Yes - based on actual field measurements. As you know, GIS is only as
> accurate at the data provided. Some wells can be off by as much as a
> couple thousand feet.
>
> * How would the owner/operator "prove" that a facility is more than
> 1,000 feet from a well?
> Field measurements by registered professional.
>
> * Is there anyone else we should consult with?
Pacific Environmental/IT Corporation : Bob Wenslau

THE
SOUTHLAND
CORPORATION

November 8, 1999

Mr. Charles NeSmith
State Water Resources Control Board
P.O. Box 944212
Sacramento, CA 94244-2120

RE: Senate Bill 989
Enhanced Leak Detection

Dear Mr. NeSmith:

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7-Eleven proposes that enhanced leak detection include a comprehensive maintenance program. 7-Eleven's maintenance program consists of contracts with local certified gasoline maintenance contractors. Should any store require gasoline repairs, the site operator calls a toll free dispatch number and orders the repairs. Repairs are prioritized and assigned to the local contractor. Most repairs are made within 24 hours, or less.

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To supplement this Preventative Maintenance Program, 7-Eleven recommends that when technicians visit a site to make repairs that may become necessary between the 120-day cycles, the maintenance technician complete a "modified" inspection checklist to ensure that no potential releases have occurred.

In addition, 7-Eleven is in the process of upgrading the existing Tidel Automatic Tank Gauge at every site to a Veederoot TLS-350. The enhanced capabilities of the Veederoot will add to leak detection effectiveness at all sites. We hope to have all stores in California upgraded by the end of 2001. Sites that fall within the 1000-foot radius of drinking water wells will receive priority status for installations.

Environmental Services Department 10220 S.W. Greenburg Road, Suite 470. Portland, Oregon 97223
Phone (503) 977-7713 Fax (503) 245-3438

I would like to participate in any committee involving the petroleum industry on this issue. Should you have any questions, please feel free to call me at (503) 977-7713.

Sincerely,

Bob DeNinno
7-Eleven, Inc.

EQUIVA SERVICES LLC
Shell, Texaco & Saudi Aramco Working Together

November 8, 1999

Re: UST enhanced monitoring at single walled component sites

Mr. Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith

Equiva Services LLC (Shell and Texaco) appreciates the opportunity to provide comments on "Enhanced Leak Detection or Monitoring for UST's with a Single Walled Component".

We believe that enhanced monitoring can be achieved through the use of third party remote monitoring. Third party remote monitoring removes responsibility from the on-site operator who is intensely involved in the ongoing business operations, and places it in the hands of a third party whose sole job is to monitor UST systems. Third party remote monitoring can be achieved through outside contractors or through the use of proprietary in-house computer applications with similar sophisticated remote capabilities that utilize Veeder Root leak detection equipment at the retail locations.

Third party remote monitoring meets all the monitoring requirements currently required under the law and has additional benefits such as consistent, accurate dispatch management from a centralized location for all sites. Third party monitoring provides continuous monitoring twenty-four hours per day, seven days per week and covers time when a station may be closed. In addition, it is possible to increase the required testing frequency such as providing a periodic .2 gph line test.

Documentation is easily available from the third party in short turn-around time for release detection and response, tank and line monitoring, monthly and annual reports, alarm history and dispatch logs without requiring the local station operator to maintain records on site. Maintaining and finding records on-site has been problematic for some operators and agencies in the past.

We believe that remote third party monitoring should be the standard for enhanced monitoring at sites with single walled components. We look forward to working with you in the development of enhanced monitoring for single walled components and will comment as new developments occur.

Please call me at (818) 736-5075 should you have any questions.

Sincerely,

Edward C Dinkfeld

Edward C Dinkfeld
SH&E Coordinator

Cc: PPugnale, JVanOrden, AMattis, MTobey, BHovland, BBryl, GWood, GMarshall

PO Box 7869
Burbank, CA 91510-7869

Chuck

City of Oxnard

October 19, 1999

Mr. David Holtry, Chief
Engineering Unit
Underground Storage Tank Program
State Water Resources Control Board
PO Box 944212
Sacramento, CA 94244-2120

SUBJECT: DEFINITION OF UNDERGROUND STORAGE TANK (UST) INSPECTION FOR CUPAs

Dear Mr. Holtry:

We have become aware that the State Water Resources Control Board (SWRCB) has defined an UST inspection differently from the Department of Toxic Substances Control (DTSC) as described in their instructions for completing CUPA annual summary reports. For example, while DTSC includes UST removal oversight as an inspection, the SWRCB does not.

We urge that both Cal/EPA agencies adopt a consistent definition so that CUPAs can reasonably use a single database for CUPA quarterly and annual reporting purposes. The inconsistency possibly results in the City of Oxnard Fire/CUPA over-reporting the number of UST inspections in quarterly reports based on the SWRCB definition.

We would greatly appreciate your response on this matter. If you have any questions, please contact me at (805) 385-7657.

Sincerely,

Joe Zarnoch

Joe Zarnoch
City of Oxnard Fire/CUPA

Fire Department
251 South C Street • Oxnard, CA 93030 • (805) 385-7722 Fax (805) 385-8009

cc: Secretary for Environmental Protection
c/o Dr. Sangat Kals, Chief
Unified Program Section
Department of Toxic Substances Control
PO Box 806
Sacramento, CA 95812-0806

Ms. Paula Rasmussen, Chief
State Regulatory Programs Division
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Dave / Chuck - Please prepare a brief response re we have rescheduled the hearing for So Cal.

CALIFORNIA CUPA FORUM

"An Association of Certified Unified Program Agencies"

5825 Rickenbacker Road, Commerce CA 90040
Phone (323) 890-4045 FAX (323) 890-4046
www.calcupa.net

2-14-2000
Left message with Doug Snyder's Secretary saying the hearing will be Alhambra, at 10:am, April 27, L.A. County Dept of Public Works
Chas DeSmith

RECEIVED

FEB 02 2000

Division of Clean Water Programs

January 25, 2000

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF CLEAN WATERS PROGRAMS
2014 T STREET, SUITE 130
SACRAMENTO, CA 95814

ATTENTION: ED ANTON

SUBJECT: SB 989 DRAFT REGULATION PUBLIC HEARINGS

The California CUPA Forum Board discussed issues associated with the draft regulations for SB 989 at the January 19, 2000 meeting in Sacramento. We have, as you are aware, the Southern California Underground Storage Tank Technical Advisory Group (TAG) which addresses issues associated with underground storage tanks (USTs). A presentation on SB 989 was given at a December TAG meeting. The presentation raised numerous concerns for the CUPAs, PAs and local representatives.

At the January 20, 2000 Unified Program Administration and Advisory Group (UPAAG) meeting in Sacramento, SB 989 was again discussed. Our concern is that the CUPA Forum Board has not received a copy of the draft regulations for the TAG to review for hearings in the near future. Based on the CUPA Forum Board's concerns, as well as the TAG, **we are requesting a public hearing on these regulations be held in the Southern California Region the first week of May 2000** so that the CUPAs, PAs and local representatives may attend and provide comments. The CUPA Forum Board is requesting that a member of State Water Resources Control Board be present. If that is not possible, we would like to request your presence at the May Public Hearing to be held in Southern California.

The CUPA Forum Board has had the opportunity to discuss this issue with Allan Patton and Terry Brazell of the State Water Resources Control Board, Division of Clean Water Program. They concur that it is extremely important to have Southern California's input where approximately 80% of the USTs are located.

We want to thank the State Water Resources Control Board for their active participation in the UPAAG, as well as in the Southern California TAG meetings. We appreciate your assistance and continued support of the State CUPA Programs.

If you have any questions, please contact Doug Snyder, CUPA Board Member, at (909) 387-8925.

Sincerely,

RYAN HILL, UST TAG Issue Coordinator
CUPA Board Member

RH:BDS:llm

cc: Don Johnson
Allan Patton
Terry Brazell
John White
Jim Smith
Chuck Nesmith
Doug Snyder

RESCUE & EMERGENCY SERVICES

ANAHEIM FIRE DEPARTMENT
Fire Prevention Division
201 S. Anaheim Boulevard, Suite 300
Anaheim, CA 92805
Phone: (714) 765-4040
Fax: (714) 765-4608

FAX TRANSMITTAL SHEET

Date: 11/1/99 Time: 1530

To: Chuck Nesmith Fax #: 916-227-4349
RWQCB

From: John White
Haz Mat Sect

No. of Pages (including this page): 2

Subject: Comment on SB 989 Staff Hearing

November 1, 1999

Chuck Nesmith
SWRCB
2014 T Street
Sacramento, CA 95814

Subject: SB 989 Staff Hearing Comments

Dear Mr. Nesmith:

Upon attending the October 28, 1999, meeting and reviewing some of the questions Allan Patton posed, I offer the following as my rebuttal:

1. Enhanced leak detection should be an additional continuous method or device. If the legislature established that the UST component is considered to be a high hazard, then adequate measures should be required to discover leakage as soon as possible. Conducting a tank or line integrity test twice, rather than once, a year would not be sufficient. This is about protecting our drinking water.
2. Enhancing currently acceptable methods would be another approach. I am very much opposed to allowing SIR to be conducted with "stick readings." Actually, I'm opposed to SIR as a leak detection method, period. Requiring a TLM for data collection would be a big improvement for SIR.
3. The deadlines for dispenser containment installation and enhanced monitoring for single-walled piping are different. Can you see the difficulty the local agency will face because of that? I recommend these sites be required to install the dispenser containment as part of enhanced leak detection. If the dispenser is the only component that is not secondarily contained, then dispenser containment should be required to be installed by November 1, 2000, to satisfy the enhanced leak detection requirement.
4. As far as the number of enhanced leak detection choices to be available, I recommend you establish only a few. It would make this requirement easier for all involved.
5. As for identifying the single-walled component sites within 1000 feet of a public drinking water well, I recommend communicating efficiently with the local agencies. I strongly believe that if you were to provide the local agency with a list of well sites, they could match the qualifying USTs fairly easily. As far as exact measurements to the single-walled component, I believe the location of the facility should be used. Where did this magical 1000 feet distance come from anyway? What about the plume spread range in the subsurface? Below grade, 1000 feet is not very far.
6. Finally, you could send out a formal letter to the major oil companies and industry organizations for their help in identification of qualifying USTs. They will want to confirm your findings anyway so maybe they will be proactive in this matter.

John White
Hazardous Materials Specialist
Environmental Protection Section
Anaheim Fire Department

TANK LINERS
INCORPORATED — SINCE 1959

October 26, 1999

State Water Resources Control Board
Attn: Mr. Charles Nesmith
P.O. Box 944212
Sacramento, CA 94244-2120

Re: Interior Tank Lining Requirements, CCR Title 23, Division 3, Chapter 16, Section 2663(h)(2) (Vacuum Test)

Dear Mr. Nesmith:

After cleaning the underground storage tank (UST), ultrasonic thickness gauging (UTG) is conducted. The tank interior is examined by a special inspector and he/she also reviews the UTG results. After this step is completed, the special inspector determines if the tank shell will provide structural support for tank lining. A UST will either pass or fail this criteria long before a vacuum test is applied, therefore the vacuum test becomes a redundant exercise. Furthermore, a precision tank tightness test is performed before the UST can be brought back into service (also making the vacuum test redundant). The vacuum test can be dangerous since you are pulling a vacuum on an atmospheric tank that was not built for such tests. Tank Liners, Inc. requests that your department considers removing this exercise from the current regulation.

Respectfully,

Albert L. Knopf

Albert L. Knopf
General Manager, TLI

3410 N.W. 264th
Hillsboro, OR 97124-5714

1-800-888-7212

(503) 648-7212
FAX (503) 640-2304

Universal Sensors and Devices Inc.
9205 Alabama Avenue, Unit C, Chatsworth, CA 91311
Phone (818)998-7121 Fax (818)998-7147

FAX TRANSMITTAL
REF. NO: 11029901

TO: State Water Resources Control Board
ATTN: Mr. Charles NeSmith
FAX NO: 916/227-4349
DATE: November 2, 1999
PAGES: 3(INCLUDING COVER PAGE)
FROM: Wen Young

RE: Enhanced Leak Detection program

Dear Mr. NeSmith:

Attached please find two pages of my comments on the subject referenced above.

Sincerely,

Wen Young

Universal Sensors and Devices Inc.

9205 Alabama Avenue, Unit C, Chatsworth, CA 91311
Phone (818)998-7121 Fax (818)998-7147

November 2, 1999

Mr. Charles NeSmith
Division of Clean Water Programs
State Water Resources Control Board
2014 T Street
Sacramento, CA 95814

Dear Mr. NeSmith:

I am one of the audience who attended the public hearing on October 28, 1999 in Sacramento, concerning the Senate Bill 989, the Enhanced Leak Detection program. I like to take this opportunity to present my feedback on the subject matter.

First, the discussions took place during the two hour meeting were primarily focused on the information of who are subject to the coming new regulation; namely the owners of tanks with single-walled components located within 1,000 feet of public drinking water wells. Very little discussions were presented on the technical aspect of how to implement the Enhanced Leak Detections. Veeder-Root Co is the only manufacturer of leak detection instruments who presented their recommendation in response to the new requirement. I seem to get the impression from their presentation that the leak detection threshold using an ATG system can be Enhanced by increasing the testing frequency. I do not believe that UST leak detection can be accomplished simply by playing the number of minimum detectable threshold.

I am not surprised to see one of the view graph presented by Mr. Allan Patton revealing that "Too many leaks have been missed by existing leak detection program." I think the leaks we have discovered so far are just the beginning. More severe problems are yet to follow later when the new tanks and piping systems installed in recent years reach their ages. I like to point out that the failure of this ten-year nationwide leak detection program sponsored by EPA is due partly to the establishment of the so-called minimum detectable thresholds, which "legalize" the slow polluters. Trace back to September 12-13, 1988, I attended the EPA-sponsored UST Conference in San Francisco. At that time, Internal Monitoring option using ATG system was gaining the momentum to be approved as a viable method for leak detection. The only critical issue on the agenda was what should be the minimum detectable threshold. From the beginning, I strongly believe that internal monitoring technologies are not suited for UST leak detection. As one of the unnoticed audience in the conference room, I raised the following lengthy question to the conference panel members:

> *It is meaningless to me that a tank integrity can be judged with a minimum detectable threshold. A tank which leaks at a rate of 0.05 gal/hr is no better than a tank which leaks at 0.1 gal/hr, because it takes just twice the time for the first tank to create the same amount of contamination as generated by the second tank. Who should be responsible for the contamination from the tank which passes the leak detection using Internal monitoring methods?*

The answer I received from the conference panel was a very simple one: "The tank owner is still responsible for the leak even though the tank passes the tightness testing" I would like to point out that many tank owners who installed ATG systems as leak detection instrument and receiving the "PASS" grade today are sleeping with a *false sense of security*. Sooner or later, nightmares will wake up those owners whose tanks generate only *small leaks*.

Without question, an ATG system is good for inventory control which is what the tank owners want anyway. The broad popularity of ATG system is elevated because it comes with an attractive bonus that it is also approved by the regulatory agencies as a viable method for leak detection. Although my question posted above did not attract much attention eleven years ago, I would like to post the identical question to the State Water Resources Control Board during your consideration on the Enhanced Leak Detection Bill. Following are my suggestions in response to the subject matter:

(1) Do not waste any more effort to "improve" the ATG technology by lowering the detectable level. The urgent issue is not how large or small the leak is, but how much the soil is being contaminated. The sure way to "catch the polluter" is to implement an Automatic External Monitoring (AEM) system, such as placing a vapor sensor inside a vadose well next to the tank to continuously recording the soil contaminant level, and provide retrievable files for trend analysis.

During the public hearing, one audience expressed concern that monitoring well can become a short circuit for pollutent to reach the groundwater. I do not believe that this concern warrants serious consideration. A properly constructed monitoring well will not become a source of groundwater contamination.

(2) The primary goal of UST monitoring program is to protect the drinking water wells from harmful contamination. If for some reason, the contaminats are not detected with the UST monitoring systems, they will eventually reach the water wells. Therefore, as a last line of defense, I strongly suggest that proper monitoring system should be installed in the vicinity of each drinking water well. As an example for consideration, installation of four vapor sensors 25 feet away from the drinking water well can provide sufficient advance warning for incoming contaminant migration. The monitoring equipment will cost approximately $2,000. The cost is not expensive considering the risk at stake.

Very Sincerely,

Wen S. Young, Ph D.
President
Universal Sensors and Devices, Inc.

To: Shahla Farahnak

From: Randy Golding
Tracer Research Corp.

Re: Tracer test survey of UST sites in CA.

What if tracer is released with a small vapor release? Can we tell the difference?

One way to tell the difference is with a depth profile. Vapor releases tend to decrease with depth and liquid releases tend to increase with depth. A very small liquid release near the surface may not be distinguishable from a vapor release. The only way for the tracer to get from the point of release to the sampling probe is as a vapor. There is nothing in any one sample that will show whether the tracer left the system dissolved in a liquid and then evaporated or evaporated inside the system and left as a vapor.

Will every minor detection require investigation or can we conclude certain small releases are only minor vapor releases?

Generally we do not recommend that minor detections (those near the limit of detection of the instrument) be investigated. When pursued, these investigations do not typically prove fruitful. A good rule of thumb would be a threshold of 10X the limit of detection combined with a requirement for reproducibility and persistence. Before extensive action is taken based on a single detection of a small amount of tracer chemical, it is prudent to see if the tracer is still detectable in a subsequent sample.

What is TRACER's experience, do they always have some kind of detection? Can they distinguish significant from insignificant?

Most tests result in no tracer detections. One good indicator of significance is whether or not the distribution of tracer looks like a leak. This usually includes high concentrations in one or two locations with diminishing concentrations in surrounding locations. Another good indicator of significance is repeatability and persistence as mentioned above. Tracer that originated from an ongoing release will typically persist in the soil. Ongoing releases of tracer labeled products can be distinguished from one-time releases by conducting a repeat test with a new tracer. An ongoing release will yield the same results in both tests. Often, high levels of hydrocarbon vapors support the locations of the highest concentrations of tracers. If the tracer is released into the ground with the product, the product should also be present in the soil near the location of the release.

How will we deal with inconclusives?

Inclonclusives, by definition, require further investigation or should default to no action. If a small amount of tracer is detected in a sample, but cannot be detected in subsequent samples collected from the same location, then no further action should be required. It is

Tracerresearch.com

not always meaningful or even possible to discover the origin of tracer detections that are not reproducible. In some instances, the cause of test results that cannot be reproduced are related to unique events such as pump maintenance that spilled small amounts of product below the dispenser. However, the cause of an unexplained detection of the tracer may not always be apparent.

How would we determine when an unauthorized release has occurred?

It might be difficult to determine from the tracer data alone. The tracer signal is not quantitative in terms of the volume of the release. It is not possible to determine how much product was released from the measured tracer concentrations. When tracer chemical escapes from the UST system and is detected in a sample drawn from a probe placed in the ground near the tank or piping, it is accompanied by a release of the product. In the very least, it is accompanied by product vapors. If the release of any amount of product vapors constitutes an unauthorized release, then any product release revealed by a tracer test would indicate an unauthorized release. When the nature of the release has been determined and confirmed, then a conclusion about whether an unauthorized release has occurred can be reached.

Is the focus of this effort on MTBE or will we be looking at a cross-section of all tanks?

If this question is meant to ask, "are only gasoline tanks going to be included in this study or should diesel tanks also be evaluated?" that is a question for the agency to decide. I do not see why limiting the study to gasoline tanks would narrow the applicability of the findings.

A separate question that is somewhat implied is whether there are release mechanisms that might allow for the release of MTBE into the environment selectively. In other words, is there some way for MTBE to escape from the UST system that would not release other gasoline constituents? The transport of MTBE through the soil as a vapor and in groundwater is selective relative to other components of gasoline. Vapor transport of BTEX compounds through the soil is much faster than MTBE. Groundwater transport of MTBE is faster than for BTEX compounds. The selective permeation through organic materials such as fiberglass resins is a plausible idea, but I am not aware of any evidence to support the idea that such a release mechanism is responsible for the selective release of MTBE. The focus of the tracer part of the study would be to look for release mechanisms. It is presumed that the release mechanisms would not be chemically selective.

After the geophysical work is done to locate the utilities and the UST system, and while technicians are available at the site, it might be useful to collect other kinds of information and samples. Soil samples and possibly groundwater samples could be collected for a variety of analyses. Other survey information such as compliance of existing systems to current regulations could also be collected.

Chuck NeSmith
State Water Resources Control Board
Underground Storage tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Subject: Written comments in response to issues and questions raised at the enhanced leak detection hearing on October 28, 1999.

In response to the Board's request for written comments we offer the following.

The board has raised several questions. It seems the chief concern is that too many leaks have been missed by existing leak detection programs and groundwater contamination has occurred in some instances. Many existing leak detection programs have vulnerabilities that could allow for undetected leaks. Some of these vulnerabilities include high leak rate thresholds and unmonitored components in the leak detection system. These unmonitored components include spillage, pumps, and vapor containment.

Enhanced leak detection should have a high probability of detecting releases before more product is released than the environment at the underground storage tank (UST) site can absorb. The minimum goal is to detect leaks before the release has an opportunity to contaminate a nearby drinking water well. The best available technology should be used. Tracer based leak detection methods offer extraordinary sensitivity without ambiguity.

Existing thresholds are too high.

Stand alone leak detection methods must be able to detect a 0.2 gallon per hour (gph) leak at least every month. A leak detection system designed to detect a 0.2 gph leak might have a threshold of 0.1 gph. The probability of detecting this leak might be as low as 50 %. At 0.1 gph, a leak can release approximately 900 gallons in a year. A release of this magnitude might contaminate a well 1000 feet away. An important limitation of internal leak detection systems is the sensitivity. Large leaks can be detected quickly, but small leaks must be ignored.

Some system components go unmonitored

Examples of portions of systems that often are not evaluated by current leak detection technologies include pump bodies and vapor containment components. While lines are often monitored, the pump itself often is not.

Systems need to be monitored for vapor releases. Pressure relief vent valves have become very common and can be designed to allow the UST to develop a slight pressure during periods when no product is being dispensed from the system. Such systems can release hundreds of gallons of vapors nightly. This is equivalent to hundreds of gallons of liquid product each year and could easily exceed acceptable levels. Since water extracts MTBE vapors from air, vapor releases are of particular concern when MTBE is present.

No matter how sensitive or reliable they can be made, many release detection methods cannot detect spills during dispensing and tank filling activities.

Of course, external product vapor monitors might, in principle, detect all of these kinds of releases, but are plagued by ambiguity problems since no one can be sure about the cause of an unexplained rise in the level of product vapors in the soil outside a UST system.

Goals

The goal of enhanced leak detection is to minimize the chance that a leak or release will go undetected long enough to lead to the contamination of a public water well. Another way to phrase this is that the intent is to prevent leakage that would lead to off site contamination. Public water wells are not likely to exist within the UST site, but might be located on an adjacent property. The wells of interest in this regulation are within 1000 feet of the UST system but are probably more than 100 feet away.

No leak detection method can achieve a threshold of zero, so the question then becomes, How small does a leak have to be so that missing it does not matter. In other words, how small of a leak should enhanced leak detection be required to detect? While it is not necessarily clear how low the new standard should be, it is apparent that the current standard of 0.1 gph to 0.2 gph (900 to 1800 gallons per year) is much too high.

Large leaks can be detected early by high frequency monitoring methods. A leak detection system capable of detecting a 0.2 gallons-per-hour (gph) leak in the first 24 hours restricts the amount of product released by such a leak to less than 5 gallons. This is a significant benefit, but it provides no protection against smaller leaks that might lead to significant contamination over time.

Small leaks must be detected, but can be detected at a lower frequency. If you could detect a 0.005 gph (40 gallons per year) you would have over 6 weeks to detect it before 5 gallons had been released. A detection threshold of 0.0005 gph would allow more than a year to pass before 5 gallons had been released.

Tracer based methods

Tracer based methods can address these concerns and achieve these goals. Acceptable sensitivities are already achievable. Sensitivities lower than 0.0005 gph or 4 gallons per year have been demonstrated by protocols more rigorous than those approved by the EPA for third party evaluations. The original third party evaluation obtained for a tracer test at UST sites was for a leak rate of 0.005 gph or 40 gallons per year. No matter what sensitivity is required, tracer methods will be able to achieve them.

Since tracer methods are external leak detection approaches, all components of the UST system including pumps, vapor containment areas and dispensers are monitored as effectively as pipes and tanks.

A consistent pattern of dispenser spills that leads subsurface contamination will also be detected by a tracer method because the product released at the dispenser will be labeled with the tracer. If enough of the product is spilled to contaminate the soil, the leak detection tracer will also infiltrate the soil and be detected. Significant spills that occur in connection with filling events could also be detected because hydrocarbon vapors are measured at the same time samples are analyzed for the presence of the tracers.

Significant vapor leakage will also be detected with extreme sensitivity. The tracers used in tracer methods are at least as volatile as the more volatile components of gasoline. After addition to the UST system, the tracers occupy the vapor space in the containment system just as the volatile components of gasoline do. Any mechanism that would release a significant amount of gasoline vapors would release a detectable amount of the tracer as well.

Possible enhanced monitoring solutions using tracer-based methods.

The complementary advantages of tracer testing and some internal monitoring methods suggest that they could be used together to some benefit. One such approach could involve periodic testing at a sensitivity of 0.005 gph or less at sites with daily monitoring at a level of 0.2 gph. These sensitivities should be achievable using state of the art ATGs and electronic line leak detectors and tracer testing. The frequency of tracer testing could be monthly, quarterly or annual based on the sensitivity and performance of the internal leak detection system.

Alternatively, monthly monitoring at a level of 0.005 gph or less could be used in conjunction with daily monitoring at a level of 1 to 2 gph. This could be accomplished with a combination of tracer-based monthly monitoring combined with careful manual tank gauging that is reconciled on a daily basis.

An automatic tracer based leak detection system is also available for installation at UST sites. So far these systems have mainly been applied to release detection at above ground storage tank farms and large underground fuel distribution systems. These systems are as sensitive as manually performed tracer tests. The application of these systems would provide continual monitoring using an on-site, tracer-based system.

Economics of each approach

The following cost estimates are for typical service stations with three 10,000 gallon USTs. With long-term contracts, small distances between sites and flexible scheduling, these prices could be significantly reduced.

Annual, tracer-based tightness tests can be conducted for an installation and initial test cost of approximately $4300 followed by subsequent annual test costs of $1500.

After installation and initial testing, monthly monitoring can be accomplished for about $4300 per year.

Continual onsite monitoring can be conducted for about $15,000 per year. This assumes a 5-year depreciation of the monitoring equipment

Developmental-phased approach to regulations

At this early stage in the development of these regulations there are many unanswered questions.

What is the relative frequency of the different mechanisms of unauthorized release? These include leakage from the pump, vent, fill riser, spills, large/rapid-onset leaks, and small/continuous releases.

How much leakage can a site absorb? How does it vary based on soil type, ground cover, depth to water and recharge rate?

What does the site-to-well distance histogram look like?

Are contamination rates for sites with double-walled systems so much lower than for sites with single walled systems that they should be excluded?

Until some of these questions are answered, it seems sensible to use the best available technologies until reasonable standards for thresholds, monitoring frequencies, site characteristics and costs can be worked out. For annual tests, the most sensitive methods should be used until evidence can be gathered to give strong support to the appropriateness of higher thresholds.

To: Charles NeSmith November 16, 1999

From: Kurt Witzgall

Re: Comments/suggestions regarding enhanced leak detection presentation

We have provided our thoughts and comments regarding the discussion points which were highlighted in Allen's presentation last week.

Discussion Point	Veeder-Root Comments
1. *Definition of "a single walled component"*	No specific comments other than the chosen definition needs to be easily verifiable.
2. Should enhanced monitoring take into account the "degree of single-walled-ness"?	No, this approach will be problematic from an enforcement standpoint.
3. What about existing technology"?	Increased testing frequency in combination with some form of remote monitoring is a good cost effective manner towards meeting the intent of Bill 989's requirements.
4. What about external monitoring techniques?	In terms of measuring sensitivity, proper external monitoring techniques are a superior method to ATG monitoring techniques, if applied with the same frequency as ATG techniques. Practically speaking though, external techniques would be prohibitively expensive if applied with the same frequency as ATG techniques. Existing ATG monitoring techniques if applied properly are a more cost effective method towards achieving the same level of protection. External monitoring techniques should only be used on an infrequent basis to ensure that ATG monitoring techniques are properly applied.
5. Should enhanced monitoring mean increasing the frequency of current monitoring techniques or should additional techniques be required?	See attached hard copy of Veeder-Root presentation regarding the most sensitive techniques that industry has to offer.
6. What are some of the specifics of appropriate, cost-effective enhanced monitoring methods? (facility down time, costs, feasibility, quality of resulting data).	Veeder-Root's recommended enhanced methods are 0.2 GPH testing via CSLD with daily printout readings, combined with 0.2 GPH monthly testing Lines via electronic leak detection and a remote monitoring service which would provide monthly test results, alarm history reports, and contractor dispatch details.

7. Should the state prescribe one method for local agency /UST owner could select?	Offering alternative methods should provide equivalent protection levels that are certified under existing EPA protocols.
8. What does the owner/operator actually have to do before Nov. 1 2000?	Obtain an approved amendment to their Existing monitoring plans.
9. How should notification occur?	No change to existing CA rule.
10. How to determine if facility is w/in 1,000 ft of a public well?	Final determination is the responsibility of LIAs
11. Can this be appealed?	Only through legal arbitration.
12. How would an owner/operator "prove" a facility is more than 1,000 ft from a public drinking water well?	Through legal arbitration
13. Is there anyone else we should consult with?	No comment.

State Water Resources Control Board

Winston H. Hickox
Secretary for Environmental Protection

Division of Clean Water Programs
2014 T Street • Sacramento, California 95814 • (916) 227-4377
Mailing Address: P.O. Box 944212 • Sacramento, California • 94244-2120
FAX (916) 227-4349 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

Check

OCT 13 1999

Interested Parties

STAFF LEVEL PUBLIC HEARING REGARDING ENHANCED LEAK DETECTION OR MONITORING FOR UST'S WITH A SINGLE WALLED COMPONENT

Senate Bill 989 was recently signed by Governor Davis and will become law on January 1, 2000. Included in this bill is a provision that owners and operators of underground storage tank systems with a single-walled component, that are located within 1,000 ft of a public drinking water well, must conduct enhanced leak detection or monitoring for these systems on or after November 1, 2000. Enhanced leak detection/monitoring is that monitoring which is in addition to the current monitoring requirements established in individual tank operating permits (i.e. SIR, ATG, LLD, tank/pipe integrity testing, etc.) This additional monitoring may include more frequent events of currently required monitoring techniques, or may consist of external monitoring such as soil and ground water investigations, tracer tests, video camera inspections, etc.

Prior to adopting regulations to implement this enhanced leak detection/monitoring program the State Water Resources Control Board (SWRCB) must consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures for enhanced leak detection. To this end, the SWRCB has scheduled a staff level public hearing for **10 a.m. to 4 p.m. October 28, 1999 at the SWRCB Board Hearing Room, 901 "P" Street, Sacramento, CA (see attached map).** Interested parties may present comments at this meeting, or may submit written comments to Charles NeSmith, State Water Resources Control Board, Underground Storage Tank Program, P.O. Box 944212, Sacramento, CA, 94244-2120. Please submit written comments by October 26, 1999. A time limit may be imposed on presentations at the hearing in order to allow all participants an opportunity to speak.

If you have any questions regarding this matter, please contact Charles NeSmith at (916) 227-4377.

Sincerely,

ORIGINAL SIGNED BY

Allan Patton, Manager
Underground Storage Tank Program

Enclosure

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Chas NeSmith 9-29-99

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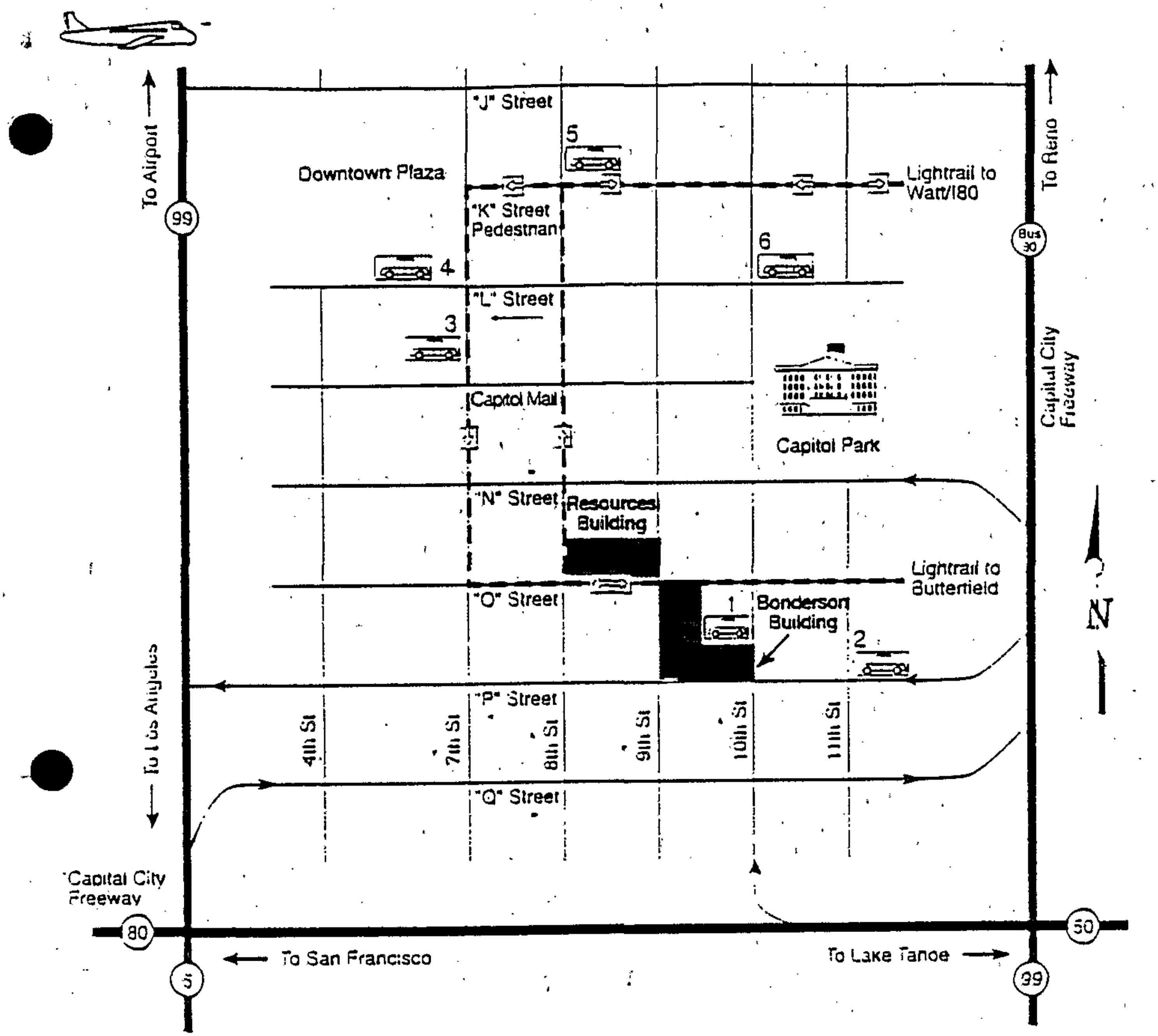

HEARING LOCATION

Bonderson Building
First Floor Hearing Room
901 P Street
Sacramento

Parking:

1. State Garage
   $0.75 per half hour
2. State Garage
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3. $6.00 per day max
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5. $5.50 per day max
6. $6.00 per day max

MAP0141

From: Shahla Farahnak
To: Nesmith, Chuck
Date: 12/17/99 9:46AM
Subject: Enhanced leak detection

If you have not reviewed Randy's comments that he had sent to you for the regulations you should. I just reviewed it and found it very informative. It does have cost estimate for various scenarios of Tracer test as well. There is also a lot of good information that you can use for the statement of reasons to justify use of this method that is best available technology.
There are a few points touched upon by Randy that the more I think about the more I think we should consider them:

1. At the site where Enhanced leak detection will be implemented, if there is a single wall tank the monitoring at the 0.2 gph should be performed daily instead of monthly, and if there is a single wall piping, the 3 gph hourly test should be supplemented with 0.2 gph daily in addition to the annual line test. Existing technologies can achieve these criteria.

2. Changing the threshold to 0.005 gph, may not be a bad idea, I could see SIR and other rude methods like ATG soon going out and getting a 0.05 gph certification and arguing that we change the regs to include them and eliminate the language regarding external. And I don't believe those methods by nature can achieve what we are trying to do with Tracer.

3. It is important that the method of Enhanced LD to also analyze sample for hydrocarbon vapors for the reasons stated in Randy's comments. So we may need to include this in the language as well.

Chuck NeSmith
State Water Resources Control Board
Underground Storage tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Subject: Written comments in response to issues and questions raised at the enhanced leak detection hearing on October 28, 1999.

In response to the Board's request for written comments we offer the following.

The board has raised several questions. It seems the chief concern is that too many leaks have been missed by existing leak detection programs and groundwater contamination has occurred in some instances. Many existing leak detection programs have vulnerabilities that could allow for undetected leaks. Some of these vulnerabilities include high leak rate thresholds and unmonitored components in the leak detection system. These unmonitored components include spillage, pumps, and vapor containment.

Enhanced leak detection should have a high probability of detecting releases before more product is released than the environment at the underground storage tank (UST) site can absorb. The minimum goal is to detect leaks before the release has an opportunity to contaminate a nearby drinking water well. The best available technology should be used. Tracer based leak detection methods offer extraordinary sensitivity without ambiguity.

Existing thresholds are too high.

Stand alone leak detection methods must be able to detect a 0.2 gallon per hour (gph) leak at least every month. A leak detection system designed to detect a 0.2 gph leak might have a threshold of 0.1 gph. The probability of detecting this leak might be as low as 50 %. At 0.1 gph, a leak can release approximately 900 gallons in a year. A release of this magnitude might contaminate a well 1000 feet away. An important limitation of internal leak detection systems is the sensitivity. Large leaks can be detected quickly, but small leaks must be ignored.

Some system components go unmonitored

Examples of portions of systems that often are not evaluated by current leak detection technologies include pump bodies and vapor containment components. While lines are often monitored, the pump itself often is not.

Systems need to be monitored for vapor releases. Pressure relief vent valves have become very common and can be designed to allow the UST to develop a slight pressure during periods when no product is being dispensed from the system. Such systems can release hundreds of gallons of vapors nightly. This is equivalent to hundreds of gallons of liquid product each year and could easily exceed acceptable levels. Since water extracts MTBE vapors from air, vapor releases are of particular concern when MTBE is present.

No matter how sensitive or reliable they can be made, many release detection methods cannot detect spills during dispensing and tank filling activities.

Of course, external product vapor monitors might, in principle, detect all of these kinds of releases, but are plagued by ambiguity problems since no one can be sure about the cause of an unexplained rise in the level of product vapors in the soil outside a UST system.

Goals

The goal of enhanced leak detection is to minimize the chance that a leak or release will go undetected long enough to lead to the contamination of a public water well. Another way to phrase this is that the intent is to prevent leakage that would lead to off site contamination. Public water wells are not likely to exist within the UST site, but might be located on an adjacent property. The wells of interest in this regulation are within 1000 feet of the UST system but are probably more than 100 feet away.

No leak detection method can achieve a threshold of zero, so the question then becomes, How small does a leak have to be so that missing it does not matter. In other words, how small of a leak should enhanced leak detection be required to detect? While it is not necessarily clear how low the new standard should be, it is apparent that the current standard of 0.1 gph to 0.2 gph (900 to 1800 gallons per year) is much too high.

Large leaks can be detected early by high frequency monitoring methods. A leak detection system capable of detecting a 0.2 gallons-per-hour (gph) leak in the first 24 hours restricts the amount of product released by such a leak to less than 5 gallons. This is a significant benefit, but it provides no protection against smaller leaks that might lead to significant contamination over time.

Small leaks must be detected, but can be detected at a lower frequency. If you could detect a 0.005 gph (40 gallons per year) you would have over 6 weeks to detect it before 5 gallons had been released. A detection threshold of 0.0005 gph would allow more than a year to pass before 5 gallons had been released.

Tracer based methods

Tracer based methods can address these concerns and achieve these goals. Acceptable sensitivities are already achievable. Sensitivities lower than 0.0005 gph or 4 gallons per year have been demonstrated by protocols more rigorous than those approved by the EPA for third party evaluations. The original third party evaluation obtained for a tracer test at UST sites was for a leak rate of 0.005 gph or 40 gallons per year. No matter what sensitivity is required, tracer methods will be able to achieve them.

Since tracer methods are external leak detection approaches, all components of the UST system including pumps, vapor containment areas and dispensers are monitored as effectively as pipes and tanks.

A consistent pattern of dispenser spills that leads subsurface contamination will also be detected by a tracer method because the product released at the dispenser will be labeled with the tracer. If enough of the product is spilled to contaminate the soil, the leak detection tracer will also infiltrate the soil and be detected. Significant spills that occur in connection with filling events could also be detected because hydrocarbon vapors are measured at the same time samples are analyzed for the presence of the tracers.

Significant vapor leakage will also be detected with extreme sensitivity. The tracers used in tracer methods are at least as volatile as the more volatile components of gasoline. After addition to the UST system, the tracers occupy the vapor space in the containment system just as the volatile components of gasoline do. Any mechanism that would release a significant amount of gasoline vapors would release a detectable amount of the tracer as well.

Possible enhanced monitoring solutions using tracer-based methods.

The complementary advantages of tracer testing and some internal monitoring methods suggest that they could be used together to some benefit. One such approach could involve periodic testing at a sensitivity of 0.005 gph or less at sites with daily monitoring at a level of 0.2 gph. These sensitivities should be achievable using state of the art ATGs and electronic line leak detectors and tracer testing. The frequency of tracer testing could be monthly, quarterly or annual based on the sensitivity and performance of the internal leak detection system.

Alternatively, monthly monitoring at a level of 0.005 gph or less could be used in conjunction with daily monitoring at a level of 1 to 2 gph. This could be accomplished with a combination of tracer-based monthly monitoring combined with careful manual tank gauging that is reconciled on a daily basis.

An automatic tracer based leak detection system is also available for installation at UST sites. So far these systems have mainly been applied to release detection at above ground storage tank farms and large underground fuel distribution systems. These systems are as sensitive as manually performed tracer tests. The application of these systems would provide continual monitoring using an on-site, tracer-based system.

Economics of each approach

The following cost estimates are for typical service stations with three 10,000 gallon USTs. With long-term contracts, small distances between sites and flexible scheduling, these prices could be significantly reduced.

Annual, tracer-based tightness tests can be conducted for an installation and initial test cost of approximately $4300 followed by subsequent annual test costs of $1500.

After installation and initial testing, monthly monitoring can be accomplished for about $4300 per year.

Continual onsite monitoring can be conducted for about $15,000 per year. This assumes a 5-year depreciation of the monitoring equipment

Developmental-phased approach to regulations

At this early stage in the development of these regulations there are many unanswered questions.

What is the relative frequency of the different mechanisms of unauthorized release? These include leakage from the pump, vent, fill riser, spills, large/rapid-onset leaks, and small/continuous releases.

How much leakage can a site absorb? How does it vary based on soil type, ground cover, depth to water and recharge rate?

What does the site-to-well distance histogram look like?

Are contamination rates for sites with double-walled systems so much lower than for sites with single walled systems that they should be excluded?

Until some of these questions are answered, it seems sensible to use the best available technologies until reasonable standards for thresholds, monitoring frequencies, site characteristics and costs can be worked out. For annual tests, the most sensitive methods should be used until evidence can be gathered to give strong support to the appropriateness of higher thresholds.

ENHANCED LEAK DETECTION
PUBLIC HEARING
Additional Information

WHEN: Thursday, October 28, 1999
10 am to 4 pm

WHERE: SWRCB Board Hearing Room
901 P Street, Sacramento

WHAT: Governor Davis signed Senate Bill 989 which requires owners or operators of USTs with single-walled components to implement a program of "enhanced leak detection" by November 2000 if their tanks are within 1,000 feet of a public drinking water well.

WHY: The reason for the hearing is to obtain input from the petroleum industry, leak detection equipment manufacturers, local agencies, and environmental groups about what types of enhanced leak detection should be considered. State Water Board staff's role will be to listen to what these parties have to say about technology and procedures and then draft regulations. Before finalizing, the draft regulations will be shared with everyone attending the hearing as well as all other interested parties.

If you are unable to attend the hearing, you may send written suggestions or comments to Chuck Nesmith via fax at 916 227-4349.

TEXT OF LAW: Section 25292.4 Health and Safety Code

(a) "On and after November 1, 2000, an owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping database, shall implement a program of enhanced leak detection or monitoring in accordance with the regulations adopted by the board pursuant to subdivision (c).

(b) The board shall notify the owner and operator of each underground storage tank system that is located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping data base, of the owner and operators' responsibilities pursuant to this section. The board shall provide each local agency with a list of tank systems within the local agency's jurisdiction that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping data base.

(c) The board shall adopt regulations to implement the enhanced leak detection and monitoring program required by subdivision (a). Before adopting these regulations, the board shall consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures to implement the enhanced leak detection or monitoring program required by subdivision (a). In adopting these regulations, the board shall consider existing leak detection technology and external monitoring techniques or procedures for underground storage tanks."

State Water Resources Control Board

W[illegible]n H. Hickox
Secretary for
Environmental
Protection

Division of Clean Water Programs
2014 T Street • Sacramento, California 95814 • (916) 227-4377
Mailing Address: P.O. Box 944212 • Sacramento, California • 94244-2120
FAX (916) 227-4349 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

OCT 1 3 1999

Interested Parties

STAFF LEVEL PUBLIC HEARING REGARDING ENHANCED LEAK DETECTION OR MONITORING FOR UST'S WITH A SINGLE WALLED COMPONENT

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If you have any questions regarding this matter, please contact Charles NeSmith at (916) 227-4377.

Sincerely,

Allan Patton, Manager
Underground Storage Tank Program

Enclosure

State Water Resources Control Board

Winston H. Hickox
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ironmental
Protection

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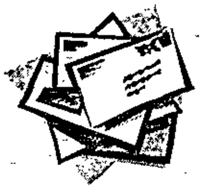
UNDERGROUND STORAGE TANK (UST) INTERESTED PARTY MAILING LIST



Enhanced Leak Detection

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- [ ] **113:** List of UST leak detection methods and amendments
- [ ] **TRN:** Notices of UST training classes and conferences
- [ ] **LGS:** Local Guidance Letters to local agencies and others
- [ ] **LTS:** List of licensed tank testers (LG-105) and amendments
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- [ ] **ATG:** Automatic Tank Gauge (ATG) Booklet and amendments

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- [x] **OWN:** Tank owner/operator
- [x] **TST:** Tank tester
- [x] **GOV:** Local agency/CUPA/other government
- [x] **LDM:** Leak detection equipment manufacturer
- [x] **TPM:** Tank and/or piping equipment manufacturer/distributor
- [x] **ECC:** Engineering/environmental consultant or contractor
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- [x] **LAW:** Lawyer
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Sierra Club
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CBE - Citizens for Better Env.
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WHITE ENVIRONMENTAL ASSOCIATES

ENVIRONMENTAL GOVERNMENT RELATIONS, BUSINESS DEVELOPMENT AND TECHNOLOGY COMMERCIALIZATION

Jim White

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253 WEST SUMMIT AVENUE
HADDONFIELD, NEW JERSEY 08033
609/795-5235 FAX 609/795-4514

August 1997

dominated by run-away industries. LA CAUSA works with the Latino community through education and empowerment. The project includes a youth program and a Resource Center

- LA CAUSA-SI targets 20 youth to receive environmentally training and education.
- The SELA Environmental Justice Resource Center, located in the city of Huntington Park, provides a space for community-based activities to take place. The Center's address is 2571 Clarendon in Huntington Park. The phone number is 213-585-3019

Community Enforcement Project uses environmental law to support our community organizing projects by forcing polluters to comply with the law and reduce their pollution.

San Francisco Environmental Health Project has reached national precedent-setting pollution prevention and jobs preservation agreements for printed circuit board makers and other electronics industry firms with several San Francisco Bay cities.

Air Pollution Trading Campaign is fighting RECLAIM, Los Angeles' smog market, through which companies can buy and sell the right to pollute.

Petrochemical Good Neighbor Project brings neighbors and workers around refineries and chemical plants together to stop the spate of chemical air releases in Contra Costa County, CA. Through this project communities have won state-of-the- art air pollution prevention regulations and community-controlled air monitoring networks.

South East Los Angeles Environmental Health Project is a collaboration of UCLA-LOSH, UCLA-COEH, and CHF to educate and empower local residents to improve environmental health conditions. This project includes the South East Los Angeles Environmental Leadership Program, a six week training program, documentation of cumulative toxins and an Environmental Health Healthcare Provider Training for practitioners.

CBE is unique among established environmental organizations in having a long-standing commitment to working with, and developing coalitions among, ethnically and economically diverse residents, community groups, labor organizations and other environmental groups. CBE publishes a quarterly newsletter, the CBE Environmental Review, which is free with a $25 membership contribution. CBE has over 7,000 members, who make the difference in our fight for clean air, clean water, and toxic free communities.

Please join CBE by sending a membership donation to:

Statewide Headquarters:

CBE
500 Howard Street, Suite 506
San Francisco,CA 94105
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email: cbesf@igc.apc.org

Southern California Regional Office:

605 West Olympic Blvd., Suite 850
Los Angeles, CA 90015
213-486-5114
email: cbela@igc.apc.org.

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Association of California Water Agencies

910 K Street, Suite 100 Sacramento, CA 95814 916.441.4545

Site Updated September 23, 1999

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CIOMA

California Independent Oil Marketers Association

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Programs & Services
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Membership Application (pdf)
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Pacific Oil Conference

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CIOMA has over *450 members, including nearly 90% of all the independent petroleum marketers in the state.* **CIOMA** works with city, county, state and federal governments to inform elected and regulatory officials about petroleum marketers' concerns. **CIOMA** helps its members stay aware of state and local issues that will affect their businesses, employees and communities. **CIOMA** is the industry legislative and regulatory watchdog.

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California Independent Oil Marketers Association
3831 North Freeway Boulevard, Suite 130
Sacramento, California 95834-1933
916.646.5999 - Facsimile 916.646.5985

Last Updated: 06/07/99 by webmaster@cioma.com

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HEALTH SERVICES AGENCY

October 25, 1999

Charles Nesmit
State Water Resources Control Board
P.O. Box 944212
Sacramento, CA 94244-2120

SUBJECT: COMMENTS ON SENATE BILL 989 PUBLIC HEARING

State law requires that underground tank sites have backfill monitoring wells installed within the tank backfill. Unfortunately, there is no requirement to have these wells sampled. A mandated sampling requirement for vapors or groundwater could provide a valuable early leak detection tool. In light of the extremely limited success of current leak detection equipment, it is imperative that we use this simple yet effective method for detecting and confirming underground storage tank (UST) releases. In addition, many active fuel stations that have been closed or inactive from previous tank leak investigations still have remaining monitoring wells. In the absence of a well installed in the tank backfill, at least one downgradient well within a reasonable distance of the tanks should be retained and monitored as part of annual leak detection monitoring.

We have found that sites with newly installed upgraded tank systems have detected MTBE in the groundwater beneath the site. We need to utilize all of the tools at our disposal in order to effectively manage MTBE in San Mateo County and the State. We have the wells. We need the authority to mandate their use.

In addition, the reference to stations within 1000 feet of a public drinking water well does not address private wells that are required to be sampled only once after installation. Many wells installed prior to local permitting requirements are undocumented. Can this issue be addressed in any way during the comment period? Should you have questions, you may reach me at (650) 363-4972. Thank you.

Sincerely,

Gail D. Lee, REHS, MS
Program Coordinator
Groundwater Protection Program

WRA
Warren Rogers Associates, Inc.

October 25, 1999

Facsimile Transmission
Fax No. 916-227-4349

Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA
94244-2120

Re: Staff Level Public Hearing regarding Enhanced Leak Detection or Monitoring for UST's with A Single Walled Component

Dear Mr. NeSmith:

Thank you for providing Warren Rogers Associates with this opportunity to provide written comments relating to SWRCB's assessment of appropriate technology and procedures for enhanced leak detection. We regret that a WRA representative will be unable to attend the staff level public hearing on October 28, 1999, and hope that these written comments provide sufficient information relating to our ideas as to how leak detection technology can be applied to fulfill California's enhanced monitoring requirements for UST's.

Introduction

Warren Rogers Associates provides SIR and networked ATG/SIR monitoring services to tank owners in California and nationwide. WRA's SIRA methods 5.1 and 5.2 are listed in LG 113-13. WRA has provided SIR services since 1984 and we are well versed in the practical uses and limitations of both manual and automated SIR applications for monitoring UST's, associated lines, and the hydraulic components of product dispensers.

Background

The enabling legislation for California's enhanced monitoring requirements derives from Senate Bill 989, which requires that tank owners with tank systems within 1,000 feet of a public drinking water well and which have a single walled component implement enhanced leak detection on or after November 1, 2000. Enhanced monitoring may include more frequent events of currently required monitoring techniques or may consist of external monitoring.

\\Wrogers\bill\SWRCB102599.doc

747 Aquidneck Avenue Middletown, Rhode Island 02842 (401) 846-4747 Fax (401) 847-8170

Discussion

The following are issues frequently encountered in any discussion of release detection matters and are relevant to the SWRCB's assessments of enhanced monitoring alternatives. The relevance of SIR in addressing these issues is discussed below,

Issue One: The UST Leak Detection Effectiveness Study conducted by UC Davis indicates that among the most problematic release sources from tank systems is product piping, particularly near the dispenser. These preliminary studies have shown that, when there is a product release from piping near the dispenser, there is little distinction in system design between piping that did or did not have a release and that there are more releases associated with the dispenser area than from the remaining piping.

Use of SIR to Address this Issue: SIR is unique among volumetric leak detection methods in that the procedure identifies losses not only in the tanks and associated lines, but also from filters and hydraulic components within the dispenser. SIR tracks product from the moment product is delivered into the tank until it is dispensed through the nozzle, whereas most other volumetric monitoring identifies losses in the piping up to the shear valve. The only other alternative procedure that identifies losses in this portion of the tank system is the use of non-discriminating pan sensors.

Issue Two: A common source of problems with release detection monitoring is the improper installation, operation, or maintenance of leak detection equipment. In several cases, such problems are associated with inadequate tank owner/ operator training.

Use of SIR to Address this Issue: SIR quantifies the accuracy of data used in the analysis through a calculation of Minimum Detectable Leak (MDL). The MDL is the smallest leak that can be detected given the data provided and is calculated using a preset probability of detection of .95 or greater and a preset probability of false alarm of 0.05 or less. Consequently, MDL is an objective measure of the quality of data provided. Within the context if the issues being addressed by SWRCB, MDL validates the accuracy of data gathered through manual gauging techniques. Additionally, when used in networked ATG/SIR applications, the MDL provides an ongoing assessment of the quality of data being provided by an automatic tank gauging system and can be used to verify if the ATG is being maintained for proper operation. In advanced ATG/SIR applications, data can be retrieved from a variety of different gauging systems and the results of periodic monitoring from each type of ATG in a networked application can be listed in SIR reports that summarize the independent monitoring results in a common format. This significance of this capability is that older ATG systems that lack electronic line leak detectors or the capability for remote monitoring can be upgraded to have a remote monitoring capability for tanks and lines without incurring the costs of ATG replacement. Further, such networked systems can be used with older ATG's to monitor for product losses from dispensers.

Suggested Approach

Where enhanced monitoring is required, we are suggesting the following procedures for more frequent or extensive monitoring of UST's:

- Where SIR is in use, upgrade the frequency of monitoring and review from monthly to weekly.
- Allow tank owners with early generation ATG's to use networked SIR monitoring (on a weekly basis) as a means of monitoring dispensers as well as a ongoing method of monitoring for sustained gauge performance.
- That the option of networked ATG/SIR applications be considered at unattended cardlock facilities to overcome the fact that an operator is unavailable to respond to potential site alarms that may arise.

If you have any questions or comments, please don't hesitate to contact me at 1-401-846-4747 or e-mail: wjones@wraenviro.com.

Sincerely,
WARREN ROGERS ASSOCIATES, INC.

William P. Jones
Executive Vice President

\\Wrogers\bill\jls\WRCB102599.doc

HEALTH SERVICES AGENCY

October 25, 1999

Charles Nesmit
State Water Resources Control Board
P.O. Box 944212
Sacramento, CA 94244-2120

SUBJECT: COMMENTS ON SENATE BILL 989 PUBLIC HEARING

State law requires that underground tank sites have backfill monitoring wells installed within the tank backfill. Unfortunately, there is no requirement to have these wells sampled. A mandated sampling requirement for vapors or groundwater could provide a valuable early leak detection tool. In light of the extremely limited success of current leak detection equipment, it is imperative that we use this simple yet effective method for detecting and confirming underground storage tank (UST) releases. In addition, many active fuel stations that have been closed or inactive from previous tank leak investigations still have remaining monitoring wells. In the absence of a well installed in the tank backfill, at least one downgradient well within a reasonable distance of the tanks should be retained and monitored as part of annual leak detection monitoring.

We have found that sites with newly installed upgraded tank systems have detected MTBE in the groundwater beneath the site. We need to utilize all of the tools at our disposal in order to effectively manage MTBE in San Mateo County and the State. We have the wells. We need the authority to mandate their use.

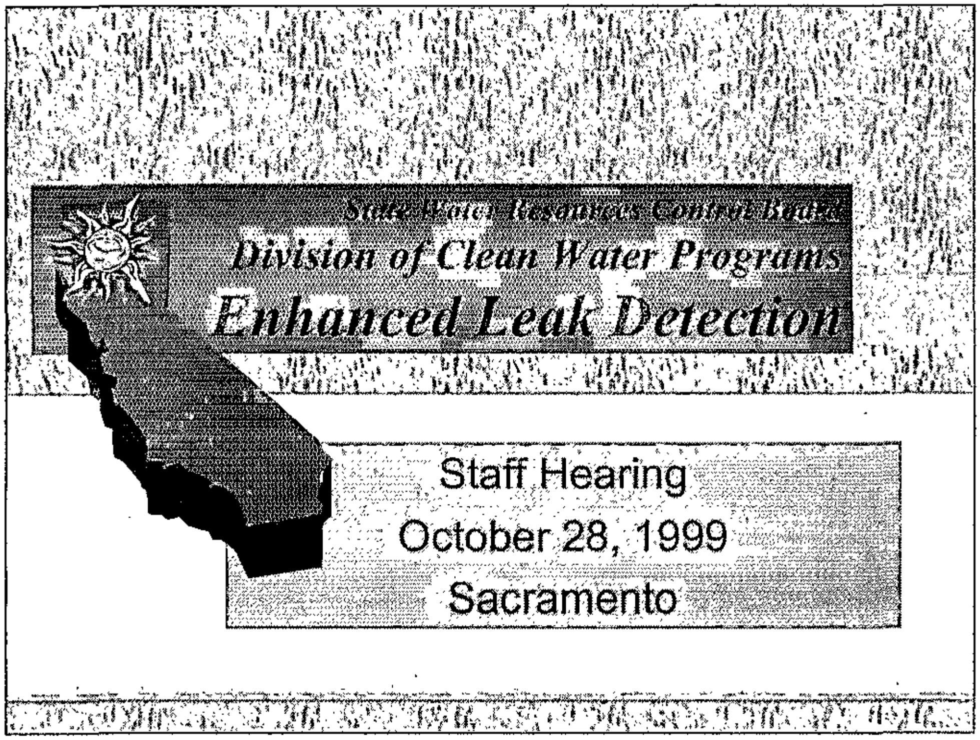
In addition, the reference to stations within 1000 feet of a public drinking water well does not address private wells that are required to be sampled only once after installation. Many wells installed prior to local permitting requirements are undocumented. Can this issue be addressed in any way during the comment period? Should you have questions, you may reach me at (650) 363-4972. Thank you.

Sincerely,

Gail D. Lee, REHS, MS
Program Coordinator
Groundwater Protection Program

PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION DIVISION

455 County Center • Redwood City, CA 94063 • PHONE 650.363.4305 • TDD 650.573.3206 • FAX 650.363.7882
http://www.health.co.san-mateo.ca.us


State Water Resources Control Board
Division of Clean Water Programs
Enhanced Leak Detection
Staff Hearing
October 28, 1999
Sacramento

SB 989: H&SC 25292.4

- On and after November 1, 2000, the owner or operator of a UST system with a single-walled component located w/in 1,000 ft. of a public drinking water well, as identified by the state GIS mapping database shall implement a program of enhanced leak detection or monitoring in accordance with regulations.

H&SC 25292.4 (cont'd)

- The board shall notify the owner and operator of each UST system within 1,000 ft of a public drinking water well as identified by the state GIS mapping database, of the owner and operators' responsibility, and shall provide a list of such tank systems to the local agency.

H&SC 25292.4 (cont'd)

- The board shall adopt regulations to implement the enhanced leak detection and monitoring program. Before adopting these regs, the board shall consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures to implement the program.

H&SC 25292.4 (cont'd)

- In adopting these regulations, the board shall consider existing leak detection technology and external monitoring techniques or procedures for USTs.

Purpose of Legislation

- Too many leaks have been missed by existing leak detection programs.
- In the short-term, while MTBE remains in gasoline, we need to do a better job of monitoring tanks in sensitive areas (ie: w/in 1,000 ft of a well)

Subjects for Discussion: Tech 1

- What is a "a single-walled component" ?
- Should enhanced monitoring take into account the "degree of single-walled-ness" or age?

Subjects for Discussion: Tech 2

- What about existing technology?
- What about external monitoring techniques?
- Should enhanced monitoring mean increasing the frequency of current monitoring techniques, or
- Should additional techniques be required?

Subjects for Discussion: Tech 3

- What are some of the specifics of appropriate, cost-effective enhanced monitoring methods? (Facility down time, costs, feasibility, quality of resulting data)

Subjects for Discussion: Proc. 1

- Should the state prescribe one method for use statewide or a range of options from which the local agency could select.?
- What does the owner/operator actually have to do before Nov. 1, 2000?

Subjects for Discussion: Proc. 2

- How should notification occur?
- How to determine if facility is w/in 1,000 ft of a public well?
- Can this be appealed?
- How would an owner/operator "prove" a facility is more than 1,000 ft from a public drinking water well?
- Is there anyone else we should consult with?

ENVIRONMENTAL SUPPORT SERVICES, Inc.
3705 Trindle Road, Camp Hill, PA 17011 PH# (717) 657-8766 • FAX (717) 671-9332

FACSIMILE TRANSMITTAL FORM

TO:	California SWRCB	ATTENTION:	Charles NeSmith
DATE:	10/27/99	TIME:	18:30
FAX #:	(916) 227-4349	PHONE:	(916) 227-4377
FROM:	Don Niland	#PAGES (including cover page):	4

SUBJECT:

Charles - I spoke with you yesterday. Information is attached. Thank you.

COMMENTS:

THANK YOU

ENVIRONMENTAL
SUPPORT SERVICES, Inc.
3705 Trindle Road, Camp Hill, PA 17011 PH# (717) 657-8766 • FAX (717) 671-9332

memo:

October 27, 1999

TO: Mr. Charles NcSmith - California SWRCB

FROM: Don Niland

RE: Enhanced detection/monitoring for single-walled components.

Charles - I had called yesterday to discuss the Tracer test technology and the TriCorr® leak correlation technology offered by Fluid Conservation Systems (FCS). As I had mentioned, we are a Tracer Affiliate covering Pennsylvania, Maryland, and Delaware. If you're not especially familiar with the test, I've attached handouts that provide an overview of the test methodology.

We had worked with FCS on several projects and I had agreed to contact you to determine whether the single-walled proposal would offer applications for the FCS technology. Their specialty is identifying leaks while pinpointing the leak's location with a technology that is especially cost effective on longer lengths of pipeline. FCS pioneered the technology (patented) and the instrumentation is extensively utilized by the water supply industry throughout the world.

Kurt Oberly is president of FCS and can be contacted at (800) 531-5465. A preview of their technology is offered at www.fluidconservation.com. After speaking with you, I provided an overview of the enhanced detection requirements to Kurt and requested that an informational package be forwarded to your office. However, Kurt suggested that a package that included only instrumentation and services tailored to the application would be more appropriate. Rather than forwarding a generic package, Fluid Conservation will review the detection requirements and formulate a solution that employs the most suitable combination of technologies they offer.

I have suggested that FCS request a transcript of the public hearing in order to better understand the extent of the enhanced leak detection/monitoring requirements. I will also recommend that Kurt Oberly contact you after reviewing the initial proposals offered at the public hearing. Thank you for the insight you provided. Good luck while pioneering yet another first-in-the-nation program.

Don Niland

Tracer Research Corporation

TRACER TIGHT®
TANK & PIPELINE LEAK TESTS

TRACER TIGHT ADVANTAGES

- No down time. Tests do not require that tanks or pipelines be taken out of service during any testing procedures.
- No requirement to top-off, fill or empty tanks.
- Use with any size tank or pipeline system without loss of sensitivity.
- Tanks containing fuels, lubricants, heating oils, solvents, wastewater, volatile or nonvolatile chemicals and hazardous wastes are easily tested regardless of size or type.
- Locates leak sources to within a few feet, without excavation.
- Tests will verify that new tanks, piping and upgrade equipment are leak free before the installation is accepted by the owner.
- Cost effective subsequent testing and monitoring.
- System may be used for monthly monitoring.
- Exceeds EPA requirements.

DOLLARS AND SENSE

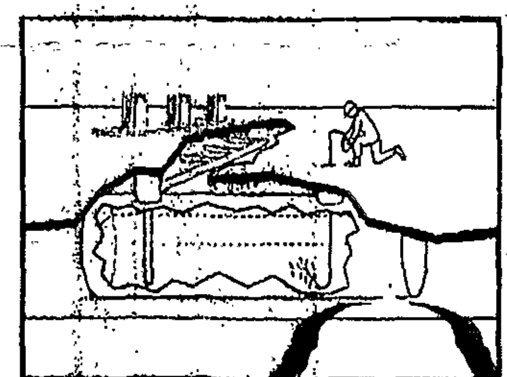
Service interruptions are costly and disruptive to tank owners. It means lost business, not only at the pumps, but from other products and services that may be offered. When there is a leak, the Tracer Tight test can discover it before it becomes a big problem that may lead to expensive remediation and liability expense.

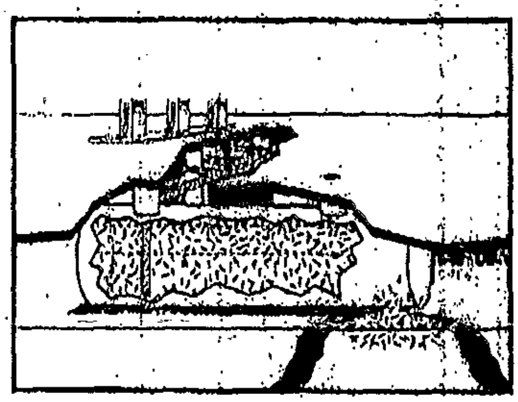
Leak Detection and Environmental Sampling Services

TRACER TIGHT LEAK TESTING METHOD

Step 1

Leak testing is performed by adding a small amount of a special volatile chemical tracer to the contents of a tank or pipeline. These chemicals are selected for their compatibility with tank and pipeline systems, as well as their absence in the environment around the tank. The tracer has no impact on the tanks and piping or on the properties of the product.



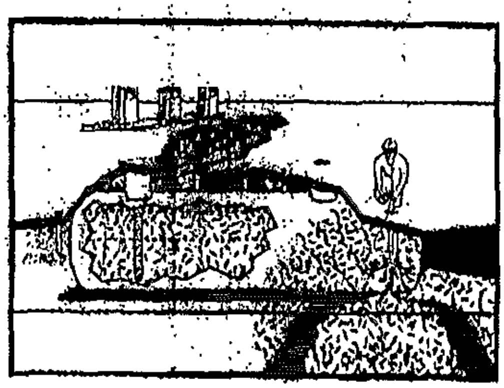


Step 2

If a tank or pipeline leaks, the tracer vapors escape into the surrounding soil.

Step 3

Detection of the tracer in the soil surrounding the tank or pipeline indicates a leak and reveals its location. Clients can also be provided with a hydrocarbon site survey. Hydrocarbon vapors help to reveal the extent of contamination.



THE *TRACER TIGHT* NO DOWNTIME TEST IS THE MOST COST EFFECTIVE TEST YOU CAN BUY

TRACER TIGHT ADVANTAGES OVER VOLUMETRIC TANK TESTING

- No service interruption during testing.
- Tests full, empty or partially full tanks.
- Test results are unaffected by temperature, density and vapor pressure of tank contents.
- Reliably tests tanks of all sizes.

TRACER TIGHT ADVANTAGES OVER VACUUM TESTING

- Tracer Tight works under real field conditions. Third party evaluations of Tracer Tight were conducted using a variety of real world situations rather than carefully controlled laboratory conditions.
- Tracer Tight will not be foiled by the ingress of previously leaked fuel. Fuel ingress does not produce a detectable signal.

TRACER TIGHT ADVANTAGES OVER OTHER VAPOR MONITORING TESTS

- No background problems. Results are unaffected by the presence of chemicals or hydrocarbons from old leaks or spills.
- Problems from false alarms are virtually eliminated.

MONTHLY MONITORING OR RETESTING

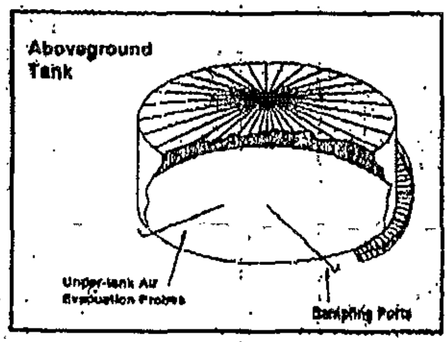
Once sampling probes are installed and an initial test is performed, Tracer Research can provide leak monitoring or retesting on a monthly basis or whenever leaks must be verified.

Costs for Tracer Tight monitoring and retesting are extremely competitive with other systems.

ABOVEGROUND STORAGE TANKS

Aboveground tank testing is performed by inserting vapor sampling probes under the tank bottom. Tracer is then added to the product. In the event of leakage, tracer is carried into the soil where it evaporates and spreads into the soil porosity. Samples are collected from under the tank and are analyzed for the presence of tracer.

A patented "Tracer Check Test" is performed to prove test accuracy and validity. The test is used to simulate leakage and determines the ease with which a leak can be detected.



A monitoring probe system is installed under the bottom of any existing aboveground tank to provide extremely sensitive, low cost, leak monitoring capability.

TESTING AND LEAK LOCATION IN PIPELINES AND LONG TRANSFER LINES

Tracer Tight pipeline leak testing is effective for locating leaks in all types of installations, including pipes buried under pavement, airline runways, buildings, or underwater.

Where leaks are known to exist, the Tracer Tight test determines leak location without expensive excavation.

This is the only practical external pipeline monitoring system that can be retrofitted to existing underground piping.

TANK FARMS

Tracer Tight leak tests are the most economical means for testing aboveground and underground tanks and pipelines at large tank installations, such as jet fuel systems at military bases, large airport hydrant fuel systems, pipeline terminals and refineries. Important benefits result from the fact that the Tracer Tight method tests very large tanks with the same sensitivity as small tanks and is performed without taking the system out of service. The method is extremely effective in testing complex systems.

TRACER TIGHT AFFILIATE NETWORK

Tracer Tight tests are conducted by a nationwide network of trained and licensed affiliates. Many of them are tank management firms offering a full spectrum of services for tank owners and operators. In addition to a variety of tank tests, they offer site assessments, tank and pipeline upgrades, monitoring, tank removal and site cleanup.

ESSI
ENVIRONMENTAL SUPPORT SERVICES, Inc.
8705 Trindle Road
Camp Hill, PA 17011

COMPREHENSIVE INTEGRITY TESTING SERVICES FOR BOTH UNDERGROUND and ABOVEGROUND STORAGE TANKS
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Western States Petroleum Association

COMMENTS ON THE PROPOSED REGULATIONS BEFORE THE SWRCB'S UST REGULATORY REVIEW PANEL

Background

The State Water Resources Control Board (SWRCB), pursuant to a directive from Governor Wilson to Cal-EPA, is embarking on a routine process of reviewing the appropriateness of the slate of regulations applicable to underground storage tank (UST) systems. The SWRCB, in the context of this review, has proposed approximately thirty revisions to the UST regulations. These proposed revisions have been presented to the UST Regulatory Review Panel; representatives from WSPA and two of its member companies participate on the panel.

These comments are the comments of the Western States Petroleum Association, and its member companies, regarding both the review process and the specific regulatory proposals.

Timing of the Current Regulatory Review

In December 1998, the petroleum marketing industry, along with other UST owners, concluded a 10-year long program of upgrading UST systems to meet federal and state requirements. Although a large number of UST sites have met upgrade requirements for several years, the December 22, 1998 deadline represents the milestone for conformity with UST upgrade requirements across the nation and across California. Even though the compliance milestone only occurred approximately one month ago – and there is insufficient experience to determine whether or not there are reasons for continuing concerns – the SWRCB is proposing some very significant changes to the UST regulations.

WSPA notes that several of the regulatory proposals seem to be motivated by concerns regarding MTBE contamination. While these concerns are, for the most part, legitimate, it must be recognized that the concerns are essentially "historical" in nature. We believe that there is insufficient knowledge to conclude that upgraded UST systems do not offer appropriate protection to the environment. In addition, there are numerous legislative and regulatory factors that will likely have a strong influence on the likelihood of continuing use of MTBE or other oxygenates in motor gasoline. Therefore, WSPA strongly encourages the SWRCB to avoid predicating any new UST requirements on the desire to mitigate the release of MTBE pending the conclusion of current proposals to address the use of MTBE as a component of fuel.

WSPA believes that, in general, it is premature to propose changes – particularly substantive ones – to existing regulations. Both the University of California Report on the Health and Environmental Assessment of MTBE ("UC Report") and the SWRCB Advisory Panel Report on the Leak History of New and Upgraded UST Systems ("UST Advisory Panel") recommend further research of upgraded UST systems prior to developing proposed changes in design, construction, monitoring, operation, or maintenance requirements for current and future UST systems. (The UC report recommends a 3-year study; the UST Advisory Panel recommends a 2-year study). Thus, it would be perfectly appropriate to defer significant revisions to existing UST regulations until the completion of this research.

WSPA suggests that, even though substantive changes would be deferred, the SWRCB can still comply with the Executive Order by streamlining its regulations and aligning them more closely with federal regulations. In fact, several of the recently proposed changes have the effect of clarifying requirements or reducing the burden on impacted facilities.

Focus of the Proposed UST Regulations

WSPA notes that many of the regulatory proposals – particularly the major ("red") regulations – focus on "hardware" issues. The report of the UST Advisory Panel, by contrast, concluded that "releases at UST sites meeting the 1998 standards generally appeared to be the result of improper installation, operation or maintenance." The Panel used actual field data and UST leak investigations to develop recommendations for training, best management practices, contractor certifications, reporting procedures, installation and inspection procedures, testing, and enforcement. In fact, fully ten of the eleven recommendations of the UST Advisory Panel address "operational" requirements.

Recommendations

WSPA strongly recommends that the SWRCB, and its regulatory review panel, do the following:

1. Re-focus the review of UST regulations in light of the conclusions reached by the most recent UST studies that most of the actual problems are operations-related.

2. Re-evaluate the timing for any proposed regulatory revisions in light of the UST Advisory Panel's recommendation for renewed research prior to further upgrade requirements, and the UC report which estimates a reduction in the incidence rate of UST leaks (from the current annual 2.7 leak incidence rate, to a rate of 0.7 with upgraded systems).

WSPA Comments on Specific Regulatory Proposals

WSPA comments on both the major ("red") and non-major ("blue") regulations are shown on the following pages. While we understand, and appreciate, that a distinction is being made between the "red" and the "blue" regulations, we note that many of the proposed "blue" regulations would have a very significant cost associated with their implementation.

Proposed "Red" Regulations

1-a. *Replace all single wall fiberglass tanks at the end of their life time (initial manufacturers warranty, usually about 30 years)*
1-b. *Or, perform site investigation, and*
1-c. *Internal inspections of the tank every 5 years after that life time.*

(Note: WSPA has separated this proposal into three sections for ease of commenting.)

Tank lifetime. WSPA-member companies know of no reason why fiberglass tanks – even those that are single-wall – should not be considered to have an indefinite useful life. As a practical matter, the only problems that can develop are related to the installation environment of the tank, or to holes in the bottom caused by the gauging stick. There are, to our knowledge, no findings by the UST Advisory Panel to the contrary.

Shape change is one of the precursors of tank failures. Thus, the likelihood of problems related to the installation environment of the tank can be assessed by periodically checking for:

i. Tank shell deflection (i.e., diameter dimensions that are either too large [standing up] or too small [squatting]) that exceeds manufacturer's specifications.
ii. Bottom flattening, or,
iii. End-cap droop.

Techniques are under development that may be able to monitor tank shape changes periodically without any invasive procedures or tank down-time. Therefore, WSPA suggests that it would not be unreasonable to require these dimensional checks as frequently as, perhaps, every other year.

Problems caused by a gauging stick puncturing the bottom of the tank are not expected to continue because tank bottom protection has been put into place as part of the recent UST upgrades.

Manufacturers' warranty periods are unrelated to the expected life, or useful life, of a fiberglass tank. Warranties are simply commercial claims designed to help sell a product in the face of competition. Single-walled fiberglass tanks have been in petroleum use for approximately thirty years, and these older systems continue to give satisfactory service. If, with the passage of time, problems develop, industry should not be prevented from repairing, rebuilding, relining, etc., a tank using any approved process that exists today or that may become available in the future. Outright tank replacement is seldom necessary.

Site investigations. Site investigations determine the condition of the ***site***, not the condition of the ***tank***. (As a practical matter, much of the contamination found in and around UST systems can be traced back to housekeeping or maintenance-related activities. Therefore, requirements for turbine containment, under-dispenser containment, and Stage I spill containment will virtually prevent the majority of releases.)

Because site investigations do not reveal anything about the UST itself, they easily produce results that are unrelated to the operation of the entire facility (neither past <u>nor</u> current operation). In addition, the work involved in conducting a site assessment can actually cause problems due to inadvertent damage to equipment. WSPA-member companies are strongly opposed to the concept of mandated site assessments.

<u>Internal inspections</u>. The concept of internal tank inspections is one that may warrant further development. Various internal inspection techniques, that do not require the tank to be taken out of service (a critical criterion), are being developed. WSPA believes that UST owners might be able to support some reasonable requirements regarding internal tank inspections.

2. Replace all Single-Wall fiberglass and steel piping with Double-Wall systems within a five year gradual time frame (by location or age).

WSPA believes that it is premature to establish a phase-out schedule for single-wall piping. The UST upgrade regulations required that, effective December 22, 1998, single-wall piping systems be upgraded to include automatic line leak detection systems capable of shutting off the pump in event of a line leak or failure of the detector. Thus, all single-wall piping systems in the state are now continuously electronically monitored with both positive shut down and fail safe.

UST owners spent considerable sums of money installing these systems, and there is no adverse operational data to justify a blanket conversion to double wall piping. WSPA suggests that the performance of the upgraded single wall systems be monitored for at least three years before any further consideration of the need for additional improvements or replacement with double-wall systems.

3. Repeal sections dealing with open and pea-gravel fill interstitial spaces. All new construction should be limited to closed double-walled systems and UST systems in a vault – current (open) systems should be replaced with closed systems. Systems with open interstitial spaces have had monitoring system and sensor problems associated with water intrusion.

WSPA does not object to a proposed prohibition on new installations of open double wall systems. However, we strongly believe that it is neither environmentally beneficial nor cost-effective to require retrofit of existing open (or, "trench-type") systems. Trench-type secondary containment systems have been in operation for many years and we know of no releases of product to the environment that are attributable to failures of the trench-

type containment system. These systems, properly operated and maintained, are effective secondary containment systems.
UST agencies seem to have three main concerns with trench-type systems – all of which can be effectively addressed by operational and/or equipment improvements.

a. The potential for water intrusion. Some agencies maintain that the trench-type system should be kept dry (i.e., free of water) at all times. However, as a practical matter, there is no real environmental harm caused by the presence of water in the trench providing that the monitoring system is capable of detecting a release of product into the trench, and that there is sufficient free-board in the trench to contain any product.

California statutes (e.g., Health & Safety Code § 25191) recognize the potential for water intrusion into trench-type systems, and specify minimum containment volumes, along with other requirements. Consequently, trench systems are designed to contain considerable quantities of water without compromising their ability to contain a release of product from the primary containment system.

b. Unreliable sensors. Although some older monitoring systems were capable of distinguishing between water and product, they were not able to monitor the depth of water or product over the full range of trench depth. New systems, currently available, are capable of monitoring the presence of product at any depth in the trench.

c. Inability to conduct a leak test of the system after it has been placed in operation. WSPA acknowledges that there are no existing methods for conducting a leak test of the trench after it has been placed in operation. However, this shortcoming of the system could be mitigated by requiring continuous electronic line leak detectors with automatic system shutdown for the piping contained within the trench. Such a requirement would provide leak protection equivalent to the current requirements for single wall piping.

In summary, WSPA recommends that, instead of considering replacement of trench-type secondary containment, the focus should be on improvements to the systems as discussed above.

4. Require replacement of upgraded Single-Wall tank and piping systems within 15 years of the upgrade.

This proposal is <u>very</u> broad and, therefore, difficult to comment on. Further, since it is proposed that the actual upgrade date would be the trigger for the fifteen-year clock, there could literally be immediate requirements on some facilities – a situation that WSPA would find unacceptable. Accordingly, we suggest the following:

a. We would like to learn the specific concerns that are the genesis for this proposal.

b. Separate the specific concerns so that each may be discussed on an individual basis.

5. Require site assessment and an overall evaluation of the site conditions at all UST systems every ten years.

With respect to the site assessment requirement, please refer to our comments under item number "1-b", Site Investigation, above. With respect to the "overall evaluation of the site", details are necessary before meaningful comments can be made.

6. Prohibit Statistical Inventory Reconciliation (SIR) monitoring as a leak detection method.

This proposed prohibition is too general. For example, it should be recognized that several systems now successfully use SIR techniques in their imbedded software; this prohibition could unintentionally become a ban on the use of these systems.

SIR is a monitoring method allowed by US-EPA, and WSPA believes that SIR works well when implemented correctly. This proposal to outlaw the use of SIR is contrary to the philosophy of aligning California regulations more closely with federal requirements wherever possible. WSPA suggests that any concerns with current practices should be specified so that they can be addressed, rather than instituting an blanket prohibition on the use of SIR.

7. Require installation of dispenser pans, fill sumps, and turbine sumps at all UST sites within the next five years (gradual by location or age).

WSPA could offer "qualified" support this proposal. However, there are several issues that require further discussion and clarification:

a. The proposed timing requirement needs to be clarified. Further, the suggested compliance time-frame for this proposal seems to conflict with the timing requirements contained in other reg-reform proposals.

b. Since, as a practical matter, this proposal would become a <u>retrofit</u> requirement, there needs to be some flexibility regarding the criteria for achieving "secondary containment". For example, under-dispenser containment might not have to be a metal pan, per se, and sites that already have a form of under-dispenser containment (including trench-type systems) should be made exempt from retrofit requirements. WSPA suggests that the SWRCB develop performance standards (as opposed to equipment standards) to allow for the use of alternate technologies.

c. The development of appropriate testing requirements is an essential component of these potential retrofit requirements. WSPA believes that, too often, attention is focused on sumps that are retaining water rather than on dry sumps that might be allowing any entrapped liquids to leak out.

d. The proposal needs to be clear regarding its intended scope. For example, WSPA could not support a retrofit requirement for under-dispenser containment unless the language specified that compliance with the requirement does not trigger a replacement of single-wall lines.

e. The universe of potentially affected facilities needs to be clearly specified. The UST Advisory Panel report, as well as SWRCB's LG-138, refers to this requirement as being applicable for UST's installed after July 1, 1987, as opposed to all UST sites.

8. Require all manufacturers that have products that come in contact with fuel to have (and submit) independent testing organization approval stating that they have been tested for compatibility with MTBE and other oxygenates. These components must also be tested for permeability and the report should list the permeation rate (as public information, not trade secret). For permeability there is a need for development of a testing standard as well as an environmental permeation standard.

This proposal, if it is to be progressed, can only be a long-term goal. However, WSPA questions the need for "formal" requirements of this type.

a. This proposed requirement is too general; it could be interpreted to cover an unnecessarily broad range of equipment.

b. There is no apparent need for formal compatibility-testing requirements. The University of California study, "Leaking Underground Storage Tanks (USTs) as Point Sources of MTBE to Groundwater and Related MTBE-UST Compatibility Issues", concluded that MTBE poses no significant threat to UST systems.

c. It should be noted that many of the formulation changes in fuels are well within the spectrum of current UL testing procedures for equipment. The most "aggressive" petroleum fractions are used as isolated tests to assess material compatibility, thus, future fuel formulation changes are unlikely to adversely impact manufactured products.

d. As correctly stated in the proposal, acceptable, peer-reviewed testing protocols – such as one for permeability – must be developed as none exist today. (What is meant by the term "environmental permeation standard"?)

e. The current proposal would require the submission of "approvals" to the state. The proposal should spell out the possible actions that the state would take, and the criteria to be used in determining appropriate actions.

f. Lastly, and possibly of greatest importance, is the fact that legislative and/or regulatory activity may play a decisive role in determining the future use of MTBE or other oxygenates in gasoline.

9. Allow only the use of automated leak detection systems that do not involve the operator for monthly monitoring, and phase the requirement in over a five year period.

WSPA believes that, since the facility owner/operator is legally responsible for compliance with rules and requirements governing the operation of the facility, it would be inappropriate to mandate that the owner/operator be excluded as is apparently being proposed. In fact, automated systems do not work successfully without station operator awareness and involvement. Some facilities are starting to subscribe to third-party monitoring services; however, these arrangements are business decisions made by site owners based on their individual needs and their respective judgements. We believe that third-party monitoring should remain an option not a mandate.

It should also be noted that many sites are operated by franchisees who have contractual obligations requiring them to operate in compliance with regulations. Taking this obligation away from the station operator by substituting an automated system may effectively transfer this responsibility from the operator to the facility owner.

We suggest that specific concerns with either compliance issues, or equipment-related issues, be enumerated so that specific remedies may be developed.

10. Do away with all grandfathered substandard systems by the year 2010.

WSPA suggests that, if a site has been upgraded and certified, that it is arguably not "Substandard". Substandard sites, we believe, are no longer in operation.

If, by use of the terms "grandfathered" and "substandard", reference is made to single-wall tanks and lines, non-secondarily-contained turbine sumps, dispensers, and trench systems, all of these issues seem to be addressed by items 1 through 9, above (expect that the proposed timing requirements are not consistent). As previously discussed, the proposed replacement of single-wall tanks and lines, in particular, should be based on performance and not driven by an arbitrary time schedule.

RRWilkniss
01/29/99

Proposed "Blue" Regulations

1. Require local agencies to maintain an updated computerized database of all their UST sites with details on the system components, leak detection, inspection frequency and the due dates for monitoring results. This data should be accessible to the State Water Board.

WSPA believes that, given the problems with the implementation of the UST certification program – and the preparation of lists of compliant sites, it may unrealistic to propose that local agencies maintain their respective databases on UST sites. (We wonder if a database coordinated and maintained by the state might not be a better approach?) There is also the question regarding who will ultimately pay for this additional record keeping effort (i.e., will local agencies absorb the costs, or will the costs be passed along to UST owners?).

2. Get authority for the State Water Board staff to inspect UST sites unannounced and take enforcement action against the tank owners who fail to comply and the agencies who fail to enforce the program requirements.

While WSPA would think that the SWRCB currently has adequate authority to conduct inspections, we submit that our criteria for judging enforcement programs are: consistent, equitable treatment at lowest cost.

We believe that there may be a positive role that the SWRCB could play. WSPA strongly favors the consistent interpretation of regulatory requirements among agencies. We believe that enforcement policies and practices must apply equally to all operators. However, WSPA-member companies are not very enthusiastic about the possibility to having to pay for redundant inspections by multiple agencies – neither are they interested in becoming involved in inter-agency disputes.

3. Require that tank and piping installation and removal contractors, in addition to meeting the CSLB requirements, have a certificate of training in the UST installations (there is a national organization providing these certificates based on intensive course work, also there are universities offering extensive training).

WSPA believes that the concept of contractor training is a good one. However, because success depends upon proper implementation, and because proper implementation requires significant planning, this item can only be a long-term goal.

Among the complex issues to be addressed are the following:

a. How is the curriculum developed, by what means is the training given, and what type of entity will offer the training?

b. What is the role of training offered by equipment manufacturers? (In our view, the equipment manufacturers are really the only ones who posess the detailed knowledge and requisite experience necessary to train contractors who will work on their respective systems.)

c. Does every employee of a contractor need to be trained and certified? Who keeps track of the training received by contractor personnel?

d. What are the legal issues, if any, associated with this potential certificate program?

4. Require some kind of certification and licensing for the contractors performing the annual leak detection equipment certifications and establish a standard procedure for them to follow.

In addition to our comments on item Number 3, above, we note that all contractors performing annual certifications on monitoring systems must have passed a manufacturer's training program for the system they are certifying. Because, it is the equipment manufacturers that set the standards for both operation and testing; it would seem that state involvement is unnecessary (however, exceptions to manufacturer-directed training should be considered for the few systems or companies that are no longer in production or in business).

5. Amend Section 2635(a)(2)(A) to require that cathodic protection systems be tested annually instead of "at least every three years", so as to be commensurate with annual certification of monitoring equipment. This is because cathodic protection is equally as important monitoring.

Cathodic protection is a form of corrosion control – it is not a monitoring system, and there is no valid basis for treating it like a monitoring system. Current requirements for inspections of cathodic protection systems, based on several decades of operational experience, are entirely adequate. (It should be noted that both Federal and state regulations already require 60-day performance inspections in addition to the three-year testing and certification.) Additionally, these sites are all now required to have a monitoring system / methodology for detecting leaks.

6. Amend Section 2635(b)(3) to require that a fuel transfer be witnessed and attended by a person at all times regardless of the volume involved.

WSPA would like to learn of the concern that this proposal is designed to address. We believe that most fire department codes already include this requirement. Many fire departments also require permits before transferring product from a tank. Where a

witness/attendant is required, the only acceptable witness to a fuel delivery is the driver of the tank-truck.
In addition to more information regarding the basic concern, more specificity is needed. For example, would a person be required to be in attendance for an underground siphon system since this is a "transfer" and volume is not a determining factor?

7. Reword Sections 2636(c)(1) and 2636(g)(1) to state that a sensor must be located within three inches of the lowest point of a collection sump.

The placement of probes in sumps continues to be a focus of controversy by local agencies. However, WSPA believes that this is a situation where a prescriptive rule, with a single highly-specific requirement, will not be applicable to every system (e.g., sumps that use a tank top attachment collar).

A dimensional standard should not be the only one. The primary criteria should be that the system sounds an alarm before a release to the environment is possible. Thus, WSPA recommends a dual-standard – a set dimension (perhaps, the proposed three inches, or, a distance specified by the sensor's manufacturer) or a fixed percentage (perhaps, twenty percent) of containment capacity, whichever is greater. Further, final rule language must comprehend the various types of sensors that are in use in the field (e.g., sensors that may not be compatible with a single dimensional standard are Detex cable, high level sensors, and vapor sensors).

8. Amend Sections 2646.1(d)(1) and 2646(j) to require that statistical inventory reconciliation companies notify the local agency of inconclusive or possible unauthorized release results.

Consistent with our comments on the proposed "Red" regulation Number 9, the facility owner/operator is legally responsible for compliance with regulatory requirements; that responsibility should not be transferred to a third-party. Further, enforcement is the exclusive province of regulatory agencies, not contractors or service providers.

SIR vendors do not possess, or have ready access to, adequate operational information to make a determination whether or not a tank should be reported to an agency. For example, many SIR programs are tank-specific, and do not adjust for errors in blend ratios on mid-grade mechanically-blended systems. Facilities with blender systems can easily show a shortage on one tank and a corresponding overage on the other tank.

9. Require tank owners to use a certified contractor who will monitor the tank system on behalf of the tank owner (i.e. take the tank owner out of the monitoring loop altogether since it has been found that response to monitoring system alarms does not produce adequate results).

Here again, WSPA observes that the facility owner/operator has the legal responsibility for compliance. If the SWRCB, or the local agencies, believe that there is a problem with inadequate response actions, any deficiency should be remedied by appropriate enforcement not by requiring major (expensive) upgrades to existing monitoring systems.

While third-party (i.e., automated) monitoring may become more commonplace, the choice to contract with a third-party is, appropriately, a business decision by the facility owner. Facilities that utilize automated monitoring should definitely not be relieved of the responsibility for compliance, or, excluded from active participation in the oversight of USTs under their control.

10. Require secondary containment of waste oil and other low-volume gravity flow fill pipes;

WSPA submits that it would be helpful if we knew the nature of the perceived problem that this potentially expensive measure attempts to address (we are unaware of any significant problem associated with these systems).

11-a. Require annual maintenance certification companies to be licensed, and
11-b. Also require the results of annual maintenance checks to be sent to the permitting agency.

(Note: WSPA has separated this proposal into two sections for ease of commenting.)

Contractor licensing. The concept of contractor licensing, as also discussed in items Number 3 and 4, may be a reasonable – albeit, long-term – goal. Structuring a licensing program will be a significant effort if it is to be done well.

Submission of reports. With respect to the proposal to send reports to the permitting agency, it occurs to WSPA that local agencies already seem to be overburdened with the task of managing currently-required reports and permit renewals. A requirement to submit reports of the annual maintenance checks will add to their existing burden. Local agencies have ready access to the report of the annual maintenance check, a copy of which is kept at the site.

12-a. Require electronic monitoring control panels to provide a printout of alarm history reports and
12-b. Provide diagnostic testing; and

(Note: WSPA has separated this proposal into two sections for ease of commenting.)

Alarm history. WSPA notes that some control panels already have the capability to print an alarm history. However, the use of this option requires proper factory training and certification, plus a laptop computer. WSPA is very concerned that unqualified, untrained inspectors will only misinterpret the information that is output by the system. While there are existing systems that would meet this requirement, there are systems (that fully meet current requirements) that cannot be upgraded; these would require a complete replacement at significant cost.

Diagnostic testing. With respect to a requirement for systems to provide diagnostic testing, the extent of the potentially required diagnostic capabilities will be an important consideration. Selected newer systems feature some self-diagnostic capabilities; however, there will be at least some information that is not accessible.

13. Require pump shutdown on all pressurized piping if the sump sensor detects a release, fails, or is disconnected.

This is a simple proposal that addresses very complex circumstances. Although we are concerned about the apparent lack of information supporting the existence of a problem, it seems that the intent of this proposal is to curtail a possible release until a qualified maintenance mechanic can be summoned to identify the problem and remedy its cause.

WSPA believes that this proposal needs additional development; however, we offer the following preliminary comments:

a. There is already a requirement for single-walled piping systems to shut down product if an automatic line leak detector fails or is disconnected. This being the case, it should not be necessary to require the shutdown of a product pump if there is a signal from a probe located in a sump. If it is thought that there is a specific problem (e.g., trench liners that are monitored in a sump) WSPA suggests that the problem be addressed by the development of performance standards rather than a broad regulation on all piping.

b. Experience shows most of the liquid accumulation in sumps is water not product. WSPA is concerned that, if, per proposed "Blue" regulation Number 7, probes are to be no higher than three inches off of the bottom, the power will be shut off to a lot of product turbine pumps even electronically pressure monitoring provides assurance that the lines are tight.

c. We need to be concerned with "false" alarm signals. A product line sensor can be thrown into alarm simply by running out of product, other alarms are caused by stuck floats, etc.

d. The scope of automatic actions, triggered by an alarm or a failure of any sensing system, must be focused on likely cause of the signal. While, under certain circumstances, the shutdown of a product pump would not be inappropriate, WSPA cannot envision circumstances that should be allowed to trigger the closure of the entire site.

14. Add an exemption to 2621(15) to include tanks less than 1500 gallons capacity which are: 1) situated upon or above the surface of the floor; 2) located in a structure which provides adequate secondary containment; and, 3) inspected weekly and the results logged by the owner or operator.

WSPA believes that this proposal will have little, if any, impact upon our member companies because they are unlikely to own or operate affected facilities. Thus, we have no comments to offer.

15. Amend the regulation of above ground piping associated with underground tanks to exclude (from non-visual monitoring requirements) that piping which is above ground and for which leaks can be detected by direct viewing

WSPA would like to gain additional understanding of this proposal prior to commenting.

16. Amend the definition of a vaulted tank system to include an exemption for the attached double-walled piping in situations where the piping secondary containment drains into the sump of the vault for visual inspection of leaks.

WSPA is inclined to disagree with this proposed exemption. Although we would benefit from having additional information on this issue, we are unaware of any justification for treating these piping systems differently from any other double-wall system.

17. For consistency with Federal Regulations (40CFR 280.12), amend the California definition of an underground storage tank to exclude a "flow through process tank".

WSPA strongly supports any proposal to align state regulations more closely with Federal regulations.

18. Per Federal Rules, Amend the regulations to exempt any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the NRC.

WSPA supports this proposal.

19. Amend the regulations to permit Regional Water Boards to grant variances for

Article 6 (tank upgrades).

WSPA believes that this proposal needs further discussion (don't we consider the upgrade requirements to be a "done-deal"?). While variances may be appropriate in some situations, state-wide uniformity and equity among all UST owners will be essential considerations.

RRWilkniss, 01/29/99

Supplemental Items
(Described in an **e-mail**, dated January 5, 1999, from Charles NeSmith, SWRCB.)

1. Fuel Containing MTBE to be Deemed a Hazardous Substance. A "suggestion" has been has been given to me as an alternative to considering a blanket requirement for secondary containment for all underground tanks within 15 years. In recognition that the new "demon" chemical constituent is now MTBE, because it has been shown to be far more persistent in the environment than benzene and thus a significantly greater threat to groundwater, this proposal would classify fuel containing MTBE (at a percentage to be determined) as a hazardous substance. Thus, such fuel would then be required to be stored in double-walled systems.

WSPA believes that, with the recently concluded process of upgrading UST systems, reliable and appropriate protection has been provided to valuable natural resources. WSPA, as we stated in our introductory remarks, concurs with the recommendations of both the UC Report and the UST Advisory Panel that there be further research of upgraded UST systems prior to proposing substantive changes to regulatory requirements.

With respect to the proposal that fuel containing MTBE be deemed a hazardous substance requiring double-wall storage systems, the absence of a time-frame for making any necessary upgrades leads us to believe that immediate action might be required. Such a requirement would neither be acceptable nor manageable.

We have previously (in these comments) urged caution regarding reliance on MTBE issues for motivating immediate changes to UST requirements. Not only is there a need for an assessment of the efficacy of the recent upgrades, but, we must remain cognizant of the current legislative and regulatory processes that may impact the future use of MTBE or other oxygenates in gasoline.

2. Regarding the Changing Nature of Regulations. Finally, if I may wax philosophic, this regulation review is not an "all or nothing" attempt at perfection of the regulations this year. The initial impetus for conducting the review was in response to Governor Wilson's directive for Cal/EPA to review all of its regulations by the end of 1999. However, we realize that the world of underground tanks is very dynamic in response to changing technology, environmental concerns, data collection, and the political climate. Thus, the need for, and the justification to support, significant regulation changes is also dynamic. The "consensus" we may achieve on the proposed "red" and "blue" regulations this year will be based on the "state-of-the-art". Next year or the year after, may be a whole new ball game.

WSPA observes that, during the course of the UST upgrade program, there were numerous interpretations and re-interpretations of federal and state requirements motivated by an agency's desire to mandate the then-current "state-of-the-art". The resultant debates became serious obstacles to progress; those who complied early tended to regret their decision to do so because they were constantly faced with a moving target.

WSPA is, nevertheless, optimistic that we can benefit from our collective experience with the recent UST upgrade program. For example, we suggest that provisions to deal with subsequent changes be added to future requirements.

From: "Marshall GR (Glen)" <grmarshall@Equiva.com>
To: "'Chuck Nesmith'" <nesmithc@cwp.swrcb.ca.gov>
Date: 12/20/99 2:18PM
Subject: RE: Preview of Draft Regulations

Have returned comments to Ron Wilkniss at WSPA. We are all very concerned about the mandatory use of Tracer Technology. State must understand that Tracer Technology has been around for at least a decade and has largely been rejected by industry for numerous reasons. Recommend State, industry, and Tracer reps have a meeting/demonstration to better understand the proposed technology and test requirements. Unless industry concerns are addressed adequately, I see nowhere for this proposal to go except to litigation.

Glen R. Marshall, P.E.
Staff Coordinator
Technical Services - Engineering
Equiva Services, L.L.C.
Shell + Texaco + Saudi Aramco

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> -----Original Message-----
> From: Chuck Nesmith [SMTP:nesmithc@cwp.swrcb.ca.gov]
> Sent: Friday, December 10, 1999 12:59 PM
> To: weajsw@aol.com; mverneeh@co.san-diego.ca.us; Chuck Nesmith; Allan
> Patton; james_smith@eee.org; grmarshall@equiva.com;
> jsmith@fire.co.san-bernardino.ca.us; oshamgr@hmc.cc;
> david.mckinley@monsanto.com; erc@sonic.net; desperso@tosco.com;
> ron@wspa.org
> Subject: Preview of Draft Regulations
>
> Panel Members
>
> We have draft regulations and commensurate draft initial statement of
> reasons (attached) for you to preview before we publish a notice of
> proposed rulemaking. Because of the timing of the SB 989 mandated
> regulations, we have broken the regulation package into two, and possibly
> three, separate packages. The SB 989 regulations will be published first.
> I will try to get them all in one package and ready to to send to OAL by
> January 25, 2000, however, it may be that only the enhanced leak detection
> regulations will be ready at this time. There are several review steps
> beyond the SWRCB that the package must undergo before making it to OAL for
> publication in the notice register.
>

> The SWRCB initiated regulations will probably be published in March 2000.
>
> Please fax or e-mail comments to me by December 24. This quick
> turn-around is needed because the first reg package must get out of the
> SWRCB before the end of the month to make it for the January 25, 2000
> submittal to OAL.
>
> The major difference between what we had agreed on at the last meeting in
> April and what the SWRCB is actually proposing, is we deleted the proposed
> requirements for internal dimension measurements for single-walled
> fiberglass tanks. This was dropped for variety of reasons, but mainly
> because of the enhnaced leak detection requirments of SB 989 which we felt
> would fulfill the same purpose in terms of increased monitoring of
> single-walled tanks.
>
> By all means, in any which way you can, short of not reviewing the
> attached regulations, have a MERRY CHRISTMAS!
>
> Chuck NeSmith
> SWRCB
> << File: regpanelreview.doc >>

MOBIL OIL CORPORATION
3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929

TEAM MOBIL WEST
FACSIMILE DOCUMENT TRANSMITTAL

TO: Charles Nesmith **EXTENSION:** ______

LOCATION: SWRCB

FAX NUMBER: (916) 227-4349 **NO. OF PAGES** 5 **+ COVER**

SPECIAL INSTRUCTIONS: ______ **FOR IMMEDIATE ATTENTION**

______ **FOR REGULAR PROCESSING**

FROM: Stan Holm **EXTENSION:** ______

LOCATION: TORRANCE REFINERY **DEPT.** ENVIRN. HEALTH & SAFETY

FAX NO. (310) 212-4681 **BIG MAT:** 339-4681 **VERIFY** (310) 212-4519

SHOULD YOU ENCOUNTER ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CONTACT EITHER THE ORIGINATOR OR THE VERIFIER NUMBER.

COMMENTS: ______

ENVIRONMENTAL AWARENESS

Mobil Oil Corporation

3700 WEST 190TH STREET
TORRANCE, CALIFORNIA 90509-2929

December 23, 1999

Mr. Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith

We appreciate this opportunity to review and comment on your preliminary draft of the UST regulations mandated by Senate Bill (SB) 989. Mobil fully supports the comments submitted by the Western States Petroleum Association (WSPA).

In particular, we strongly agree with WSPA's position that the testing requirements of Senate Bill (SB) 989 were never intended to apply retroactively to existing systems. As you know, the statute mandated the adoption of regulations on or before January 1, 2001, which require testing of secondary containment components upon initial installation and periodically thereafter. As WSPA stated in its comments, it was the understanding of WSPA-member companies involved in the negotiations that lead to the passage of SB 989 that the testing requirements only would apply to systems installed after January 1, 2001. This understanding was based in part on the statutory language requiring testing upon initial installation of a secondary containment system. Mobil received these assurances throughout the negotiations, and we based our support of the legislation on that belief.

If the testing requirement is imposed retroactively, we have several suggestions that we believe would improve the proposed program. With regards to the requirement for periodic testing of secondary containment systems, we agree with your recognition of the difficulty in testing open secondary containment systems and, therefore, the need for an alternate measure in lieu of the testing requirements applicable to other types of containment systems. However, we do not believe that the proposed enhanced leak detection program, as defined in Section 2644.1 of the draft regulation, is the appropriate alternative measure. Due to potential problems with the enhanced leak detection method, as discussed below, we strongly urge you to provide an additional option.

To our knowledge, the proposed tracer-based leak detection method has not been proven in practice at service stations. Therefore, we are concerned about whether the prescribed sensitivity standard can be met with this test. Further, we suspect a test at this sensitivity level may trigger a high rate of false alarms. False alarms are likely to be triggered by vapor migration in a trench-type secondary containment system for piping. It is not clear from the draft regulation whether your intention is for the test method to determine the integrity of the primary piping or the trench. The method is not viable to determine the integrity of the trench (i.e. monitoring probes located outside the trench). Since the trench is not sealed, a vapor release within the trench from any source would necessarily leave the trench. Consequently, the system would not be able to distinguish a primary piping leak (or leak from any underground component) from a trench leak. We believe an alternative method would provide more accurate results and, therefore, be more appropriate.

Also, we believe that the test method may create a risk to the environment. This would result from the significant possibility of puncturing or otherwise damaging the fiberglass piping components of the UST system during installation of the monitoring probes.

One practical problem with the tracer-based test method is that, to our knowledge, only one vendor can conduct this test. This raises questions about cost and whether sufficient resources would be available to serve the entire industry.

Given the potential problems and uncertainties associated with the tracer-based method, we recommend that at least one more option for enhanced leak detection be incorporated into the regulation. We believe there are viable pressure decay-type tank/or line integrity test methods that would be more effective and less costly, and that would avoid the many problems outlined above.

To ensure consistency and certainty in the requirements, the regulations should not require owners and operators to obtain local agency approval of the enhanced leak detection method as contemplated in Section 2635(a)(1), Section 2635(a)(2) and Section 2644.1(a)(3) of the proposed regulation. The enhanced leak detection methods should be clearly established in the regulations or be subject to approval only by the SWRCB. This should not be delegated to the local agencies. As you know, a major difficulty in implementing the 1998 UST upgrade requirements was reaching agreement with the local agencies on the specific requirements. This was a time-consuming process due to the large number of local agencies in California. It vastly increased the complexity of the project, compressed installation schedules and increased the cost of compliance. This situation must be avoided with implementation of the enhanced leak detection program required by SB 989.

The frequency of the enhanced leak detection method is not specified in the proposed regulation. For purposes of Section 2640(h), we recommend a frequency of once every five years. For purposes of Section 2635(a)(1), we recommend that the enhanced leak test method be applied once to each secondary containment system during the period starting January 1, 2002 and ending January 1, 2005 in accordance with the following schedule:

complete testing of 1/3 of the containment systems by January 1, 2003;
complete testing of 2/3 of the containment systems by January 1, 2004; and
complete testing of all of the containment systems by January 1, 2005.

This phasing of the testing is warranted due to the large number of systems subject to the test requirement and the potential for implementation problems. Unless the testing is phased, local agencies may attempt to require the testing to be completed during the first year, which would be far beyond our means.

Also, we are concerned about our ability to replace these systems by January 1, 2005 in an orderly and cost-effective manner. During our meeting with you on November 15, 1999, a ten-year replacement schedule was discussed. We believe that a 10-year phase-out schedule is more appropriate for an undertaking of this magnitude. We request that the deadline for replacement of the systems subject to Section 2635(a)(1) be extended to January 1, 2010 with the enhanced leak detection required one additional time during the period from January 1, 2005 to January 1, 2010.

In section 2640 (h)(1), we suggest that siphon systems be added to the list of piping systems that are not included as single-walled components.

As a final comment, we suggest that the phrase *"Other than those secondary containment systems described in subparagraph (1)"* be inserted at the beginning of subparagraph (2) of Section 2635(a) to clearly distinguish UST systems subject to subparagraph (1) from those subject to subparagraph (2).

To further clarify the above comments, we have enclosed proposed language for the affected sections of the draft regulation. If you have any questions regarding these comments, please call me at (310) 212-4587

Very truly yours

Stan Holm
Issues Advisor

Proposed Language Revisions to SB 989 Mandated Regulations

Revised language for Section 2635(a)(1)

(1) The owner or operator of any open, non-sealed secondary containment system shall implement either of the following programs of enhanced leak detection in lieu of the testing required in this section:

(A) An enhanced leak detection program in accordance with subsections 2644.1(a)(1), (2), (4) and (5). This enhanced leak detection test method shall be applied once to each secondary containment system subject to this subsection during the period beginning January 1, 2002 and ending January 1, 2005 in accordance with the following schedule:
Complete testing of 1/3 of the containment systems by January 1, 2003,
Complete testing of 2/3 of the containment systems by January 1, 2004,
Complete testing of all of the containment systems by January 1, 2005.
Additionally, the owner or operator shall replace this secondary containment system with one that can be tested in accordance with this section by January 1, 2010. The enhanced leak detection test method shall be applied once to each secondary containment system subject to the subsection during the period beginning January 1, 2005 and ending January 1, 2007 in accordance with the following schedule:
Complete testing of the containment systems previously tested in calendar year 2003 by January 1, 2006,
Complete testing of the containment systems previously tested in calendar year 2004 by January 1, 2006,
Complete testing of the containment systems previously tested in calendar year 2005 by January 1, 2007.

(B) An enhanced leak detection program that consists of implementing remote monitoring of the underground storage tank monitoring systems, including electronic automatic line leak detectors, and conducting an annual integrity test of the piping within the secondary containment system. The remote monitoring shall be implemented no later than January 1, 2002. The annual integrity test shall be implemented beginning January 1, 2002 and completed annually on or before December 31.

Additionally, the owner or operator shall replace this secondary containment system with one that can be tested in accordance with this section by January 1, 2010.

Revised language for Section 2635(a)(2)

(2) Other than those secondary containment systems described in subparagraph (1), secondary containment systems must by tested in accordance with manufacturers guidelines to demonstrate that the system still meets the initial installation testing standards. If there are no manufacturers guidelines, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard.

Revised language for Section 2640(h)(1)

(1) For the purposes of section 2644.1, vent or tank riser piping, vapor recovery piping, siphon systems, and suction piping that meet the definition of section 2636(a)(1), (2), and (3), are not included as single-walled components.

Revised language for Section 2644.1(a)(1)

(a) (1) Enhanced leak detection means:

(A) A test method that ascertains the physical integrity of the underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

(B) A test method that ascertains the physical integrity of the underground tank system by the application of pressure and measuring the rate of pressure decay; or

(C) Any other leak detection test method approved by the State Water Resources Control Board.

Revised language for Section 2644.1(a)(3)

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the SWRCB within 6 months following notification by the SWRCB. The enhanced leak detection shall be implemented no later than 12 months following receipt of notification and every 5 years thereafter.

From: Don Zedrick <erc@sonic.net>
To: Chuck Nesmith <nesmithc@cwp.swrcb.ca.gov>
Date: 12/24/99 6:00PM
Subject: draft regulations

hi chuck - well the holiday caught up with us and this is not quite finished - we will get the remaining comments in by monday the 27th - i will have this better drafted at that time

don zedrick
Environmental Resource Council

1. Enhance existing tank leak detection methods for single walled tanks by increasing frequency and/or reducing the threshold:

* Automatic tank gauging is currently allowed on a monthly basis at the rate of .20 gallon per hour.

* Most automatic tank gauges can test more frequently, some can be modified for CSLD. and most can be set for .10 gallons per hour.

2. Tank overfill prevention is currently inadequate:

* Mechanical tank fill limiters are the most reliable and can be monitored by existing tank gauging equipment alarm history.

* Ball float valves are frequently not operational or simply assumed to be present thus causing tanks to be overfilled. Furthermore, in order for the ball float system to work, all venting openings must be fitted with a valve. If the system uses a coaxial vapor fill tube then the tank can be overfilled.

* High level alarms are frequently found disconnected or located where the bulk delivery driver can not hear or see them. Furthermore, these alarms are frequently silenced and the tank overfilled.

* All tank fill pipes should be required to be fitted with a positive shut-off device.

3. Tracer technology has many short comings:

* High ground water, water saturated soil, secondary containment systems and heavy soils impede the free movement of common tracer elements.

* At high volume sites it is difficult to ensure that the stored product continuously contains the required concentration of the tracer.

* Overfill vs tank/piping leak determinations can not be made unless the tracer is placed in the introduced product and in each tank. To make such determinations, numerous distinguishable tracer elements would be required.

4. Penalties/enforcement for monitoring violations are rare or non-existent:

* Annual third party inspections frequently find sumps full of water with *hitched* liquid sensors.

* Tank gauging systems are frequently not set to perform leak testing for the required duration's.

* Many sensors, pump shut down features and the like have been disabled by operators or service people.

- Strict penalties need to be enforced upon those who violate the law.

5. Post installation integrity testing of most secondary containment systems is impractical:

* It will be difficult for the tester to actually determine the manufacturer of the secondary containment system to be tested, as would be required in order to comply with the manufacture*s testing protocol. Frequently this information is not even available in the LIA files or the installed piping was not as specified.

* Air/pressure testing of secondary containment tanks could result in damage to the secondary containment. Specifically for newer generation tanks delivered with a vacuumed secondary tank where no pressure may be applied. Many other tanks would require pressure of the primary container while test pressure is applied to the annular tank in order not to damage the primary container - this would require product removal and hazardous pressurization of flammable atmospheres.

* Many older secondary piping containment systems are not fitted or accessible for post installation testing and end termination may not be readily accessible without costly excavation.

* Most secondary containment systems are of the atmospheric type and are design simply to allow a path for liquid to run to a collection sump. Sealing of end terminations for test purposes may not be possible and post installation disturbances may cause damage to primary and secondary components.

* In general, secondary containment systems as young as two years old were designed to meet installation testing standards of the time and did not allow, or were not designed for future routine testing.

Hydrostatic testing with water would be a common means of testing dispenser pans, piping sumps, fill containment man ways and possibly secondary piping. Since most of these areas may contain amounts of the stored product, the test water would likely become contaminated requiring costly handling and disposal. Hydrostatic testing of containment systems could thus generate millions of gallons of uncontrolled waste water statewide.

6. Enhance *secondary containment monitoring for all tank systems:*

All containment liquid monitoring systems should be configured to automatically shut-down the delivery systems based on volume not time. A large enough leak could easily overwhelm a containment sump it allowed to continue for 24 hours. An alarm only for water or low fuel levels is acceptable in the event that automatic positive pump shut down occurs before the sump actually becomes full.

7. Annual compliance inspections of fuel facilities should be conducted by both the LIA *and a reputable service person.*

The inspection would be completed with both the expertise or the regulatory agency and a knowledgeable service person who could field demonstrate monitoring devices and facilitate a thorough inspection. A regulatory inspector should not be expected to have the expertise, training or ability to access and manipulate devices. Nor should the facilitator of the inspection have the expertise, training or ability needed to determine if the site is configured and operating according to the regulations and permit conditions or to address violations discovered.

Furthermore, such a facilitated inspection is consistent with the common tank installation and removal format and would allow the inspector to actually witness, first hand, under real conditions, monitoring reports, areas not normally accessible, monitoring equipment operation and to determine competency of the special inspector as would be needed for the three required referrals.

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Comments of James S. White
on
Draft CA UST Regulations (12/10/99)

Amend Section 2633(d)(1) ... The reference for this proposed regulatory change does not match the regulations currently posted on the SWRCB US T Website.

1. The requirement for a training renewal once every three years is justified as installation practices, procedures and equipment change over the years. Information from forensic investigations going to these training sessions could be an added benefit to such periodic training. See my "Other Comments."

2. There does not seem to be any provision which covers the new requirement under Section 25284.1(a)(4)(A)(i) for expanded training of UST owners, operators (I hope that this includes everyone employed at the facility) and inspectors. Is this to be the subject of future rulemaking? The sooner the better. Many LIAs have already instituted their own training requirements for UST owners/operators.

3. As this provision falls under the section covering new installations, I would want to make sure that this training requirement covers any and all repair and upgrade activities under Article 6, "UST Repair and Upgrade Requirements."

Add New Section 2635 ... Based on the current regulations posted on the SWRCB Website, it appears that "Installation and Testing Requirements for All New USTs" will be eliminated and replaced.

1. The new Section should be 2635.1.

2. I support the SWRCB's observation regarding the slight benefits to be gained with a testing cycle that would be more frequent than once every 3 years.

3. I also support the exemption given to secondary containment systems with automatic "continuous" testing.

4. There should be leeway granted for the development, issuance and transfer to UST agencies an electronic version of the "monitoring system certification."

Add Section 2644.1 ... In the SWRCB analysis regarding monitoring sensitivities, it must be recognized that at least three studies (SWRCB-Farahnak, UCDavis-Couch&Young and UST Panel-Team 2&3) have pointed to the potential significant contribution that disconnected/disabled leak detection devices have had in the large number of releases discovered during the removal of UST systems. The SWRCB may be invoking more onerous measures due to a theory without much in the way of facts.

1. Understanding the lack of much wiggle room with regard to the statutory requirement, but there is a great level of discomfort with regard to a requirement which can be met by only one method and, perhaps, one vendor as proposed. There should be some additional consideration given to the benefits of tighter internal detection methods (e.g., more periodic ATG testing) as an alternative for enhanced leak detection. Even though increased false-alarms may occur for these UST sites in sensitive areas, further investigation should be mandated. As currently written (see #2) this would be more protective.

2. The way this is written, the external enhanced leak detection would appear to be a snapshot in time with no apparent additional periodic monitoring/testing required after the initial test. I don't believe that that was the intent of this requirement. Then we must consider how frequent such testing should be done? No more frequent than once

a year and no less frequent than once every 3 years. Given the significant impact of local hydro-flow conditions, perhaps the frequency should be site specific.

Amend Subsection 2633(a)(2)(A) ... The reference for this proposed regulatory change does not match the regulations currently posted on the SWRCB US T Website.

1. It would appear that this may be overkill. Either require annual inspections of cathodic protection systems or require the maintenance of a log. Perhaps the option should be given to the UST owner with a requirement for the submittal of log summaries in lieu of test results? I believe that if the log option is selected by the UST owner, testing once every 3 years should be required.

2. Electronic means of submitting of test/log information should be provided.

Add Subsections 2634(h) and (i) ... I note that there is no subparagraph (g).

Add Subsection 2640(e) and (f) ... This added requirement would cause more effort and trouble than it is worth. If existing UST systems have any non-compatible components, there is most likely no documentation and it is most likely too late to take appropriate action. Permeability information is practically nonexistent. So why put the regulated community and the agencies through such an exercise? This requirement is really more appropriate for new UST system installations.

Other Comments ...

Forensic Investigation -- There is a requirement in SB 989, Section 25284.1(a)(1)(A), for the SWRCB to initiate a field-based research program that would, among other things, "seek to identify the source and causes of releases and any deficiencies in leak detection systems." This should become a requirement for all UST systems found to have failed. This process would serve to prevent the continued installation of potentially faulty equipment and the use of inappropriate installation procedures. The additional cost of performing a forensic investigation in conjunction with the characterization and the quantification of a release is minimal but the benefit for potential UST program improvements is great.

Any requirement for forensic investigation of failed UST systems must include provisions for the reporting of the findings to the agency, the UST owner/operator (O/O), the UST installer/maintainer, equipment manufacturers and those conducting required UST training programs.

Under-Dispenser Containment – This proposed rulemaking does not codify the various mandates in SB 989, Section 25284(a)(5)(A), (B) and (C), for the installation of under-dispenser containment Is this going to be covered under separate rulemaking?

Annual Agency Inspections -- There are no proposed amendments that would codify the section in SB 989 covering annual inspections of the UST sites by agencies or "special investigators" as mandated by SB 989, Section 25288(a), (b), (c) and (d). I presume that this would be the subject of additional rulemaking?

WEA ustcmt1224

Western States Petroleum Association

Via e-mail and First Class Mail

December 22, 1999

Mr. Charles NeSmith
Underground Storage Tank Program
State Water Resources Control Board
Division of Clean Water Programs
2014 T Street (P.O. Box 944212)
Sacramento, CA 94244-2120

Dear Mr. NeSmith: Chuck

WSPA COMMENTS ON PREVIEW DRAFT UST PROPOSALS

Thank you for the opportunity to preview the draft UST regulation changes. We are pleased to have been included in the reg-review process, and we appreciate the opportunity to provide you with our comments. These comments are offered as comments from the Western States Petroleum Association (WSPA) – a trade association representing over thirty companies that produce, refine and market petroleum products in California. Many of our member companies operate UST systems that will be impacted by the proposed regulatory changes.

First, a few explanatory comments:

- Due to the pressure of time, our comments focus only on the proposed changes which are associated with the requirements of SB 989. We would welcome the opportunity to provide comments on the changes being proposed by the SWRCB (i.e., the second half of the package) at a later date.

- Consistent with the comment above – and because we believe that some of the SWRCB-initiated requirements may be inconsistent or unnecessary following the SB 989 requirements – WSPA strongly recommends that the proposed rule-making be separated into two packages.

- We do have one preliminary comment with respect to the proposed changes being initiated by the SWRCB – we note the proposal (in new Section 2630(f)) to require the submission of compatibility and permeability data to the local agency when the "type of product or fuel formulation changes". We would advise you to both clarify and limit the scope of "formulation changes" because there are changes of no consequence that should not require any action. For example, gasoline changes seasonally as required for summer and winter volatility limits, additive packages change occasionally, and other insignificant changes occur with some normal frequency.

505 No. Brand Blvd., Suite 1400 • Glendale, California 91203 • (818) 545-4105 • FAX: (818) 545-0954

- While not necessarily appropriate for regulatory language, we would like to be sure that we have an opportunity to work with you to ensure that notifications pertaining to the applicability of enhanced leak detection requirements are coordinated with respect to timing (e.g., separate or "batch" notifications), and agreement regarding the identification of the appropriate person to receive the notifications.

Specific comments on the proposed regulations are shown on the attached sheets.

Please do not hesitate to call me, 818/543-5324, with any questions that you may have.

Sincerely,

Ronald R. Wilkniss
South Coast Issues Coordinator

Western States Petroleum Association

COMMENTS on SB 989 MANDATED UST REGULATION CHANGES

Amendments relating to tank installer training (amendments to Subsection 2633(d)(1)).

Because the tank and the piping may be made by different manufacturers, we suggest that the proposed language read, ".... ~~a~~ certificates of training issued by both the tank and/or piping manufacturers, as appropriate."

Amendments relating to secondary containment testing and annual maintenance certification (added new Section 2635).

2635(a). Existing systems should not be subject to these requirements. It was the definite understanding of WSPA-member companies, that were involved with the negotiations that lead to the passage of SB 989, that the new requirements for testing secondary containment were not applicable to existing systems – rather, the requirements would only be applicable to those systems, installed after January 2001, that had been specifically designed to be tested.

With respect to the proposed three-year testing frequency, we very much appreciate the pragmatic approach taken by the staff – specifically, that the slightly increased benefit which might be attributable to annual testing is not justified by a tripling of the cost.

2635(a)(1).

It is being proposed that existing secondary containment systems, which cannot be tested, must be replaced by January 1, 2005. It is important to consider that, while testing can identify the presence or absence of a problem, there will be numerous sites at which no problem exists regardless of whether or not the site is tested. Thus, we must raise an objection to a potential requirement to replace systems and/or components merely because they cannot be tested. There is no demonstrable environmental benefit to be obtained through this requirement.

We submit that SB 989 took into consideration the fact that existing secondary containment systems were not designed to be tested, and therefore applied the requirement only to new systems "upon installation". Also, please refer to our comments under Section 2644.1, below.

In summary, we believe that proposed section 2635(a)(1) is inconsistent with the intent of SB 989 and should be deleted.

2635(a)(2).

WSPA suggests the following changes, "Secondary containment systems, other than those described in Subsection (1), ...", and "... applicable method specified in an industry code or engineering standard, or as approved by the SWRCB." State-wide consistency is very important to WSPA-member companies. In view of the fact that there should be relatively few systems for which manufacturer's guidelines do not exist, we would prefer that the state (not local jurisdictions) act to approve proposed testing methods.

2635(a)(6). but not the secondary containment!

WSPA appreciates the proposal to exempt certain secondary containment systems. However, this section should provide stronger, but more flexible, language that allows exemptions for specific UST components which are monitored continuously. For example, USTs equipped with both liquid level monitoring and interstitial monitoring are, as a practical matter, being tested *continuously.* Monitoring equipment is subject to its own testing and certification requirements, thus, very little (if any) benefit would be provided by a requirement to conduct additional routine testing. In addition, we would recommend that the statement, "....., such as ...... constant vacuum," be deleted because it adds little but might be misconstrued.

2635(b)(5).

Considering our recent experience with the logistical problems of preparing and distributing "tags or stickers", WSPA suggests that this proposed requirement be deleted. In addition to the fact that sites will have documentation on file for inspection during business hours, it seems unlikely that anyone would need to verify the certification status when the facility is closed. We believe that this requirement would add cost without offering an environmental benefit.

Amendments relating to enhanced leak detection (Section 2640).

2640(h).

We suggest the addition of language to specify that the SWRCB will be "... using the GIS database ..." to make the preliminary determination of the location of a "single-walled component" with respect to the nearest public drinking water well. We also recommend that the two points, between which the distance is being measured, be specified as, "the center-line of the well-head to the nearest single-walled component of the UST system."

2640(h)(1).

WSPA appreciates, and strongly supports, the proposed exemptions. We suggest that it would be appropriate to add "siphon piping" to the list of piping systems that are not included as single-walled components.

2644.1(a).

WSPA suggests that enhanced leak detection requirements be specifically applied to single-walled components, not to entire systems which may have S-W components. We believe that the law allows for this specificity. For example, a double-walled brine-filled UST with single-walled piping would be required to perform enhanced leak detection specifically at the location of the single-walled piping but not the double-walled tank.

2644.1(a)(1) and (2).

We offer the following comments regarding the definition and specific requirements for "enhanced leak detection":

a. First, the definition of enhanced leak detection (new Section 2644.1) is such that, to our knowledge, only one contractor – Tracer Technologies – is capable of performing the required testing. While we understand the reasons for which the requirements have been structured this way, we believe that it would be premature to place reliance on one specific type of testing. The Board is on the verge of conducting an extensive, state-wide test program and is proposing to use Tracer Technologies as the contractor. We believe that valuable experiences – showing both strengths and weaknesses of the tracer technology in a service station environment – will be gained as a result of the program. The setting of future requirements should be postponed so that we can take full advantage of the lessons learned from the state-wide testing program.
b. Industry should have more than one technology and more than one qualified contractor from which to choose.
c. If the SWRCB specifies the use of testing using a tracer chemical compound, it should be specified that it is that tracer chemical, not hydrocarbon species, for which laboratory analyses of various samples are conducted.
d. According to the requirements as currently proposed, the leak detection method should be capable of detecting a leak rate of at least 0.05 gallons per hour <u>period</u>. This is the sensitivity that you are seeking, the words "or less" increases the sensitivity to a potentially much lower threshold (for example 0.005 gph is less than 0.05 gph), and may encourage local agencies to inappropriately require extreme test procedures.
e. How are the detection "probabilities" ascertained? By what means will the provider of testing services demonstrate that they can meet these requirements?
f. WSPA member companies continue to be very concerned with the risk of damage to underground components (and resultant risk to the subsurface environment) caused by the testing process itself.

2644.1(a)(3).

We offer the following comments with respect to implementation timing.

a. WSPA members have a great interest in state-wide consistency, and would strongly prefer that the SWRCB – not the local agencies – approve proposed enhanced leak detection programs. There would be no opposition to submitting programs to local agencies for informational purposes.
b. The turnaround time for review/approval, following the submission of a proposed program, needs to be specified.
c. We do not see a requirement that enhanced leak detection has to be conducted more than one time. WSPA would support the concept of a one-time requirement, and suggest that this clarified in the regulations.

Mobil Oil Corporation

December 23, 1999

Mr. Charles NeSmith
State Water Resources Control Board
Underground Storage Tank Program
P.O. Box 944212
Sacramento, CA 94244-2120

Dear Mr. NeSmith

We appreciate this opportunity to review and comment on your preliminary draft of the UST regulations mandated by Senate Bill (SB) 989. Mobil fully supports the comments submitted by the Western States Petroleum Association (WSPA).

In particular, we strongly agree with WSPA's position that the testing requirements of Senate Bill (SB) 989 were never intended to apply retroactively to existing systems. As you know, the statute mandated the adoption of regulations on or before January 1, 2001, which require testing of secondary containment components upon initial installation and periodically thereafter. As WSPA stated in its comments, it was the understanding of WSPA-member companies involved in the negotiations that lead to the passage of SB 989 that the testing requirements only would apply to systems installed after January 1, 2001. This understanding was based in part on the statutory language requiring testing upon initial installation of a secondary containment system. Mobil received these assurances throughout the negotiations, and we based our support of the legislation on that belief.

If the testing requirement is imposed retroactively, we have several suggestions that we believe would improve the proposed program. With regards to the requirement for periodic testing of secondary containment systems, we agree with your recognition of the difficulty in testing open secondary containment systems and, therefore, the need for an alternate measure in lieu of the testing requirements applicable to other types of containment systems. However, we do not believe that the proposed enhanced leak detection program, as defined in Section 2644.1 of the draft regulation, is the appropriate alternative measure. Due to potential problems with the enhanced leak detection method, as discussed below, we strongly urge you to provide an additional option.

To our knowledge, the proposed tracer-based leak detection method has not been proven in practice at service stations. Therefore, we are concerned about whether the prescribed sensitivity standard can be met with this test. Further, we suspect a test at this sensitivity level may trigger a high rate of false alarms. False alarms are likely to be triggered by vapor migration in a trench-type secondary containment system for piping. It is not clear from the draft regulation whether your intention is for the test method to determine the integrity of the primary piping or the trench. The method is not viable to determine the integrity of the trench (i.e. monitoring probes located outside the trench). Since the trench is not sealed, a vapor release within the trench from any source would necessarily leave the trench. Consequently, the system would not be able to distinguish a primary piping leak (or leak from any underground component) from a trench leak. We believe an alternative method would provide more accurate results and, therefore, be more appropriate.

Also, we believe that the test method may create a risk to the environment. This would result from the significant possibility of puncturing or otherwise damaging the fiberglass piping components of the UST system during installation of the monitoring probes.

One practical problem with the tracer-based test method is that, to our knowledge, only one vendor can conduct this test. This raises questions about cost and whether sufficient resources would be available to serve the entire industry.

Given the potential problems and uncertainties associated with the tracer-based method, we recommend that at least one more option for enhanced leak detection be incorporated into the regulation. We believe there are viable pressure decay-type tank/or line integrity test methods that would be more effective and less costly, and that would avoid the many problems outlined above.

To ensure consistency and certainty in the requirements, the regulations should not require owners and operators to obtain local agency approval of the enhanced leak detection method as contemplated in Section 2635(a)(1), Section 2635(a)(2) and Section 2644.1(a)(3) of the proposed regulation. The enhanced leak detection methods should be clearly established in the regulations or be subject to approval only by the SWRCB. This should not be delegated to the local agencies. As you know, a major difficulty in implementing the 1998 UST upgrade requirements was reaching agreement with the local agencies on the specific requirements. This was a time-consuming process due to the large number of local agencies in California. It vastly increased the complexity of the project, compressed installation schedules and increased the cost of compliance. This situation must be avoided with implementation of the enhanced leak detection program required by SB 989.

The frequency of the enhanced leak detection method is not specified in the proposed regulation. For purposes of Section 2640(h), we recommend a frequency of once every five years. For purposes of Section 2635(a)(1), we recommend that the enhanced leak test method be applied once to each secondary containment system during the period starting January 1, 2002 and ending January 1, 2005 in accordance with the following schedule:

complete testing of 1/3 of the containment systems by January 1, 2003;
complete testing of 2/3 of the containment systems by January 1, 2004; and
complete testing of all of the containment systems by January 1, 2005.

This phasing of the testing is warranted due to the large number of systems subject to the test requirement and the potential for implementation problems. Unless the testing is phased, local agencies may attempt to require the testing to be completed during the first year, which would be far beyond our means.

Also, we are concerned about our ability to replace these systems by January 1, 2005 in an orderly and cost-effective manner. During our meeting with you on November 15, 1999, a ten-year replacement schedule was discussed. We believe that a 10-year phase-out schedule is more appropriate for an undertaking of this magnitude. We request that the deadline for replacement of the systems subject to Section 2635(a)(1) be extended to January 1, 2010 with the enhanced leak detection required one additional time during the period from January 1, 2005 to January 1, 2010.

In section 2640 (h)(1), we suggest that siphon systems be added to the list of piping systems that are not included as single-walled components.

As a final comment, we suggest that the phrase *"Other than those secondary containment systems described in subparagraph (1)"* be inserted at the beginning of subparagraph (2) of Section 2635(a) to clearly distinguish UST systems subject to subparagraph (1) from those subject to subparagraph (2).

To further clarify the above comments, we have enclosed proposed language for the affected sections of the draft regulation. If you have any questions regarding these comments, please call me at (310) 212-4587

Very truly yours

Stan Holm
Issues Advisor

Proposed Language Revisions to SB 989 Mandated Regulations

Revised language for Section 2635(a)(1)

(1) The owner or operator of any open, non-sealed secondary containment system shall implement either of the following programs of enhanced leak detection in lieu of the testing required in this section:

(A) An enhanced leak detection program in accordance with subsections 2644.1(a)(1), (2), (4) and (5). This enhanced leak detection test method shall be applied once to each secondary containment system subject to this subsection during the period beginning January 1, 2002 and ending January 1, 2005 in accordance with the following schedule:
Complete testing of 1/3 of the containment systems by January 1, 2003,
Complete testing of 2/3 of the containment systems by January 1, 2004,
Complete testing of all of the containment systems by January 1, 2005.
Additionally, the owner or operator shall replace this secondary containment system with one that can be tested in accordance with this section by January 1, 2010. The enhanced leak detection test method shall be applied once to each secondary containment system subject to the subsection during the period beginning January 1, 2005 and ending January 1, 2007 in accordance with the following schedule:
Complete testing of the containment systems previously tested in calendar year 2003 by January 1, 2006,
Complete testing of the containment systems previously tested in calendar year 2004 by January 1, 2006,
Complete testing of the containment systems previously tested in calendar year 2005 by January 1, 2007.

(B) An enhanced leak detection program that consists of implementing remote monitoring of the underground storage tank monitoring systems, including electronic automatic line leak detectors, and conducting an annual integrity test of the piping within the secondary containment system. The remote monitoring shall be implemented no later than January 1, 2002. The annual integrity test shall be implemented beginning January 1, 2002 and completed annually on or before December 31.

Additionally, the owner or operator shall replace this secondary containment system with one that can be tested in accordance with this section by January 1, 2010.

Revised language for Section 2635(a)(2)

(2) Other than those secondary containment systems described in subparagraph (1), secondary containment systems must by tested in accordance with manufacturers guidelines to demonstrate that the system still meets the initial installation testing standards. If there are no manufacturers guidelines, secondary containment systems must be tested using an applicable method specified in an industry code or engineering standard.

Revised language for Section 2640(h)(1)

(1) For the purposes of section 2644.1, vent or tank riser piping, vapor recovery piping, siphon systems, and suction piping that meet the definition of section 2636(a)(1), (2), and (3), are not included as single-walled components.

Revised language for Section 2644.1(a)(1)

(a) (1) Enhanced leak detection means:

(A) A test method that ascertains the physical integrity of the underground tank system by introduction, and external detection, of a substance that is not a component of the fuel formulation that is stored in the tank system;

(B) A test method that ascertains the physical integrity of the underground tank system by the application of pressure and measuring the rate of pressure decay; or

(C) Any other leak detection test method approved by the State Water Resources Control Board.

Revised language for Section 2644.1(a)(3)

(3) Owners and operators subject to the requirements of this section shall have a program of enhanced leak detection reviewed and approved by the SWRCB within 6 months following notification by the SWRCB. The enhanced leak detection shall be implemented no later than 12 months following receipt of notification and every 5 years thereafter.

CIOMA

CALIFORNIA INDEPENDENT OIL MARKETERS ASSOCIATION

3831 North Freeway Blvd, Suite 130 • Sacramento, CA 95834-1933 • Tel (916) 646-5999 • Fax (916) 646-5985

December 22, 1999

Mr. Charles NeSmith
Underground Storage Tank Program
State Water Resources Control Programs
2014 T Street
Sacramento CA 95814

Dear Mr. NeSmith:

CIOMA appreciates the opportunity to comment on the draft UST proposals created to address the provisions of SB989. California Independent Oil Marketers Association (CIOMA) is a trade association representing the independent oil marketer segment of the petroleum distribution industry, with approximately 475 members. Our members are the primary providers of fuel to a broad spectrum of California's economy, including agriculture, construction, local government fleets and emergency services, school bus fleets, and independent retailers. Regulations that impact our members also affect all their customers, in this instance directly. Our cooperative efforts with SWRCB in the past have been very positive, and we hope this effort will prove no less successful.

Our Director of Government Relations, Evelyn Gibson, is on vacation until after the first of the year, and may have some additional comments to make when she returns. We submit these comments today in response to the deadline of December 24, of which we had been unaware until yesterday.

Having reviewed the points raised by Western States Petroleum Association, CIOMA concurs with their concerns, particularly the value of statewide standards, SWRCB rather than local program control, and the importance of not replacing satisfactorily performing equipment.

On amendment to subsection 2633(d)(1), tank installer training, SWRCB comments refer to installation errors being identified as the source of leaks in new and upgraded systems, and note the need for periodic recertification and new system installation training. CIOMA notes that a greater volume of properly trained and certified contractors in business statewide will facilitate proper installation and keep costs down, satisfying environmental and business concerns as well as preserving the integrity of manufactured systems' reputations. To achieve this, it is important that manufacturer's training be widely available at a reasonable cost.

The trade associations historically have facilitated such training in coordination with manufacturers, to insure the broadest reach of requisite information. CIOMA would like to be able to provide such training as appropriate.

The tagging requirement outlined in subsection 5635 (b) (5) would, in CIOMA's opinion, become a far more burdensome than useful action. A willingness to misrepresent or falsify a maintenance certificate will not be remedied by attaching tags or stickers. If the maintenance certification requirements are clear, that should suffice. Let us simplify where we can.

Thank you for the opportunity to review this section of the proposed changes. We look forward to participating in the further development of these regulations.

Sincerely,

Marilyn Sarantis

Marilyn Sarantis
Government Relations

Copies via fax and mail.

Date: December 13, 1999

To: Chuck Nesmith

From: Jerry Bailey

Subject: YOUR SENATE BILL 989 MANDATED UST REGULATIONS CHANGES

I have reviewed the changes for the additions or amendments to Senate Bill 989 and offer the following thoughts based purely on how this will effect my company and not necessarily the general UST community.

Article 3, Section 2633 (d) (1)

> Currently do Manufacturers of UST and associated piping systems offer any type of training or certification for installers of these systems? Is the State going to require Joor or Trusco to offer a training class to contractors? I would not like to see this Bill create a monopoly, (tank installing/certification by tank and piping *manufacturers only), and exclude those companies/individuals currently* generating an income from this type of work. At one time during our discussions, we talked about a State sponsored course being taught to everyone the same way. Did this fall by the way side or prove not feasible?

Article 4, Section 2640 (f)

> On or after July 1, 2000 owners or operators of existing underground storage tanks shall submit product compatibility and permeability information to the local agency when the type of product or fuel formulation changes from what has been stored in the tank system. When I read this, it tells me that if I convert from brand X unleaded gasoline to brand Y unleaded gasoline because of pricing, or convert a tank of U/L supreme to U/L regular because of higher customer usage during summer months, I need to obtain a third party evaluation. I believe this will put an unreasonable cost on the general UST community, which will be passed on to consumers, and that this interferes with a person's rights to control his or her business. I can see this as being justified should a person want to convert a waste oil or chemical tank to a gasoline tank, but definitely not changing manufactures or grades of product.

A general comment:

Throughout these 13 pages the term "independent testing organization appears, It would be a good idea to provide a list of these approved organizations prior to this requirement being placed into effect.

From: Michael Vernetti <MVERNEEH@co.san-diego.ca.us>
To: <nesmithc@cwp.swrcb.ca.gov>
Date: 12/17/99 8:14AM
Subject: Re: Preview of Draft Regulations

Chuck, I have read this over and it looks grreat to me. You did an outstanding job!

Have a Merry Christmas and I will see you at the CUPA/UST Conference

Mike

>>> "Chuck Nesmith" <nesmithc@cwp.swrcb.ca.gov> 12/10 10:58 AM >>>
Panel Members

We have draft regulations and commensurate draft initial statement of reasons (attached) for you to preview before we publish a notice of proposed rulemaking. Because of the timing of the SB 989 mandated regulations, we have broken the regulation package into two, and possibly three, separate packages. The SB 989 regulations will be published first. I will try to get them all in one package and ready to to send to OAL by January 25, 2000, however, it may be that only the enhanced leak detection regulations will be ready at this time. There are several review steps beyond the SWRCB that the package must undergo before making it to OAL for publication in the notice register.

The SWRCB initiated regulations will probably be published in March 2000.

Please fax or e-mail comments to me by December 24. This quick turn-around is needed because the first reg package must get out of the SWRCB before the end of the month to make it for the January 25, 2000 submittal to OAL.

The major difference between what we had agreed on at the last meeting in April and what the SWRCB is actually proposing, is we deleted the proposed requirements for internal dimension measurements for single-walled fiberglass tanks. This was dropped for variety of reasons, but mainly because of the enhnaced leak detection requirments of SB 989 which we felt would fulfill the same purpose in terms of increased monitoring of single-walled tanks.

By all means, in any which way you can, short of not reviewing the attached regulations, have a MERRY CHRISTMAS!

Chuck NeSmith
SWRCB

From: "Marshall GR (Glen)" <grmarshall@Equiva.com>
To: "'Chuck Nesmith'" <nesmithc@cwp.swrcb.ca.gov>
Date: 12/20/99 2:18PM
Subject: RE: Preview of Draft Regulations

Have returned comments to Ron Wilkniss at WSPA. We are all very concerned about the mandatory use of Tracer Technology. State must understand that Tracer Technology has been around for at least a decade and has largely been rejected by industry for numerous reasons. Recommend State, industry, and Tracer reps have a meeting/demonstration to better understand the proposed technology and test requirements. Unless industry concerns are addressed adequately, I see nowhere for this proposal to go except to litigation.

Glen R. Marshall, P.E.
Staff Coordinator
Technical Services - Engineering
Equiva Services, L.L.C.
Shell + Texaco + Saudi Aramco

9/80 Schedule "A"
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> -----Original Message-----
> From: Chuck Nesmith [SMTP:nesmithc@cwp.swrcb.ca.gov]
> Sent: Friday, December 10, 1999 12:59 PM
> To: weajsw@aol.com; mverneeh@co.san-diego.ca.us; Chuck Nesmith; Allan
> Patton; james_smith@eee.org; grmarshall@equiva.com;
> jsmith@fire.co.san-bernardino.ca.us; oshamgr@hmc.cc;
> david.mckinley@monsanto.com; erc@sonic.net; desperso@tosco.com;
> ron@wspa.org
> Subject: Preview of Draft Regulations
>
> Panel Members
>
> We have draft regulations and commensurate draft initial statement of
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> January 25, 2000, however, it may be that only the enhanced leak detection
> regulations will be ready at this time. There are several review steps
> beyond the SWRCB that the package must undergo before making it to OAL for
> publication in the notice register.
>

> The SWRCB initiated regulations will probably be published in March 2000.
>
> Please fax or e-mail comments to me by December 24. This quick
> turn-around is needed because the first reg package must get out of the
> SWRCB before the end of the month to make it for the January 25, 2000
> submittal to OAL.
>
> The major difference between what we had agreed on at the last meeting in
> April and what the SWRCB is actually proposing, is we deleted the proposed
> requirements for internal dimension measurements for single-walled
> fiberglass tanks. This was dropped for variety of reasons, but mainly
> because of the enhnaced leak detection requirments of SB 989 which we felt
> would fulfill the same purpose in terms of increased monitoring of
> single-walled tanks.
>
> By all means, in any which way you can, short of not reviewing the
> attached regulations, have a MERRY CHRISTMAS!
>
> Chuck NeSmith
> SWRCB
> << File: regpanelreview.doc >>

CIOMA

California Independent Oil Marketers Association

3831 North Freeway Blvd, Suite 130 • Sacramento, CA 95834-1933 • Tel (916) 646-5999 • Fax (916) 646-5985

December 22, 1999

RECEIVED
DEC 23 1999
Division of Clean Water Programs

Mr. Charles NeSmith
Underground Storage Tank Program
State Water Resources Control Programs
2014 T Street
Sacramento CA 95814

Dear Mr. NeSmith:

CIOMA appreciates the opportunity to comment on the draft UST proposals created to address the provisions of SB989. California Independent Oil Marketers Association (CIOMA) is a trade association representing the independent oil marketer segment of the petroleum distribution industry, with approximately 475 members. Our members are the primary providers of fuel to a broad spectrum of California's economy, including agriculture, construction, local government fleets and emergency services, school bus fleets, and independent retailers. Regulations that impact our members also affect all their customers, in this instance directly. Our cooperative efforts with SWRCB in the past have been very positive, and we hope this effort will prove no less successful.

Our Director of Government Relations, Evelyn Gibson, is on vacation until after the first of the year, and may have some additional comments to make when she returns. We submit these comments today in response to the deadline of December 24, of which we had been unaware until yesterday.

Having reviewed the points raised by Western States Petroleum Association, CIOMA concurs with their concerns, particularly the value of statewide standards, SWRCB rather than local program control, and the importance of not replacing satisfactorily performing equipment.

On amendment to subsection 2633(d)(1), tank installer training, SWRCB comments refer to installation errors being identified as the source of leaks in new and upgraded systems, and note the need for periodic recertification and new system installation training. CIOMA notes that a greater volume of properly trained and certified contractors in business statewide will facilitate proper installation and keep costs down, satisfying environmental and business concerns as well as preserving the integrity of manufactured systems' reputations. To achieve this, it is important that manufacturer's training be widely available at a reasonable cost.

The trade associations historically have facilitated such training in coordination with manufacturers, to insure the broadest reach of requisite information. CIOMA would like to be able to provide such training as appropriate.

The tagging requirement outlined in subsection 5635 (b) (5) would, in CIOMA's opinion, become a far more burdensome than useful action. A willingness to misrepresent or falsify a maintenance certificate will not be remedied by attaching tags or stickers. If the maintenance certification requirements are clear, that should suffice. Let us simplify where we can.

Thank you for the opportunity to review this section of the proposed changes. We look forward to participating in the further development of these regulations.

Sincerely,

Marilyn Sarantis

Marilyn Sarantis
Government Relations

Copies via fax and mail.

CIOMA
California Independent Oil Marketers Association
3831 North Freeway Blvd, Suite 130
Sacramento, CA 95834-1928

22 '00

Mr. Charles NeSmith
UST Program
State Water Resources Control Programs
2014 T Street
Sacramento CA 95814

G. SUPPORTING LEGISLATION (SB 989)

Senate Bill No. 989

CHAPTER 812

An act to amend Sections 15399.10, 15399.11, 15399.14, and 15399.17 of, to amend and renumber Section 15399.19 of, to add Sections 15399.15, 15399.15.1, and 15399.15.2 to, and to add and repeal Section 65964 of, the Government Code, to amend Sections 25288, 25299, 25299.37.1, 25299.51, 25299.52, 25299.57, 25299.59, 25299.81, 25299.94, and 25299.99.2 of, and to add Sections 25284.1, 25292.4, 25299.18, 25299.38.1, 25299.99.3, 43013.1, and 43013.3 to, and to repeal and add Section 43830.8 of, the Health and Safety Code, to add Section 25310.5 to, and to add and repeal Section 21178 of, the Public Resources Code, and to amend Section 13752 of the Water Code, relating to pollution.

[Approved by Governor October 8, 1999. Filed with Secretary of State October 10, 1999.]

LEGISLATIVE COUNSEL'S DIGEST

SB 989, Sher. Pollution: groundwater: MTBE.

(1) Under existing law, with specified exceptions, no person may own or operate an underground storage tank containing hazardous substances unless a permit for its operation has been issued by the local agency to the owner or operator of the tank, or a unified program facility permit has been issued by the local agency to the owner or operator of the unified program facility on which the tank is located. Existing law requires an underground storage tank permit to require compliance with certain design and construction requirements, and requires the local agency to inspect every underground tank system within its jurisdiction at least once every 3 years. Existing law imposes specified civil penalties upon owners or operators of underground storage tanks who violate certain requirements.

This bill would require the State Water Resources Control Board, on or before June 1, 2000, to initiate a specified research program to quantify the probability and environmental significance of releases from petroleum underground storage tank systems that meet certain upgrade requirements. The board would be required, by January 1, 2001, to adopt specified regulations and the board would be directed to require a tank to be fitted with under-dispenser containment or a spill containment or control system approved by the board, as specified, and to review existing enforcement authority. The bill would require a local agency to inspect every tank system at least once every year, thereby creating a state-mandated local program by imposing new duties upon local agencies. The bill would require the holder of a permit for an underground storage tank, within 60 days after receiving a specified inspection or compliance report, to file a plan to implement the compliance report or make a specified demonstration. The bill would provide for the imposition of civil liability upon an operator of an underground storage tank who tampers with, or disables, automatic leak detection devices and would impose criminal penalties upon a person who intentionally takes such an action, thereby imposing a state-mandated local program by creating a new crime. The bill would require the board, in consultation with the State Department of Health Services, to develop guidelines for the investigation and remediation of MTBE and other ether-based oxygenates in groundwater and appropriate cleanup standards.

The bill also would require, on and after November 1, 2000, an owner or operator of a tank system with a single-walled component, located as specified, to implement a program of enhanced leak detection or monitoring pursuant to regulations that the board would be required to adopt.

(2) Under the existing Barry Keene Underground Storage Tank Cleanup Trust Fund Act of 1989, every owner of an underground storage tank is required to pay a storage fee for each gallon of petroleum placed in the tank. The fees are required to be deposited in the Underground Storage Tank Cleanup Fund. The money in the fund may be expended by the State Water Resources Control Board, upon appropriation by the Legislature, for various purposes, including the payment of claims of up to $1,000,000 per occurrence, including joint claims, to aid owners and operators of petroleum underground storage tanks who take corrective action to clean up unauthorized releases from those tanks. The act is repealed by its own terms on January 1, 2005.

This bill would increase the amount of a corrective action claim to $1,500,000 per occurrence, would revise the requirements for claims for regulatory assistance, and would increase the amount to $1,500,000 for joint claims. The bill would extend the operation of the act until January 1, 2011, thereby imposing a state-mandated local program by continuing the imposition of duties upon the local agencies that implement the act.

(3) Existing law authorizes the State Air Resources Board, among other things, to adopt and implement motor vehicle fuel specifications for the control of air contaminants and sources of air pollution, as specified. Existing law, however, prohibits the state board from adopting any regulation that requires the addition of any oxygenate to motor vehicle fuel unless the regulation is subject to multimedia rulemaking, as defined in existing law.

This bill would instead prohibit the state board from adopting any regulation that establishes a specification for motor vehicle fuel unless that regulation, and a multimedia evaluation conducted by affected agencies and coordinated by the state board, are reviewed by the California Environmental Policy Council. The bill would revise the procedures for the conduct of such a multimedia evaluation.

The bill would require the State Energy Resources Conservation and Development Commission, in consultation with the state board, to develop a timetable for the removal of MTBE from gasoline at the earliest possible date, consistent with a specified executive order. The bill would require the state board to ensure that specified regulations for reformulated gasoline maintain or improve upon emissions and air quality benefits achieved by other specified reformulated gasoline and are evaluated, as specified. The bill would require a city, county, or air pollution control district, upon receiving an application to construct a phase 3 reformulated gasoline project, as defined, to undertake all reasonable efforts to expedite action on the permit, thereby imposing a state-mandated local program.

The bill would also authorize the Secretary for Environmental Protection to prohibit the use of MTBE in motor vehicle fuel prior to December 31, 2002, on a subregional basis in the Bay Area Air Basin, or in any other air basin in the state, if the secretary makes specified findings.

The bill would require the commission, if it determines that specified studies do not adequately assess the ongoing supply and availability of gasoline for the state's consumers associated with the phaseout of MTBE, to submit a report to the Legislature and the Governor by July 1, 2000, concerning the impact of that phaseout on the supply and availability of gasoline.

The bill would require the board to convene a working group to review and evaluate options for the closure of certain petroleum underground storage tanks and to submit recommendations to the Secretary for Environmental Protection by January 1, 2001.

(4) The existing California Environmental Quality Act requires a lead agency, as defined, to prepare, or cause to be prepared, and certify the completion of, an environmental impact report on a project that it proposes to carry out or approve that may have a significant effect on the environment, as defined, or to adopt a negative declaration if the lead agency finds that the project will not have that effect, unless the project is exempt from the act.

This bill would, until January 1, 2003, impose certain requirements on districts and lead agencies, as defined, for purposes of that act, with regard to the processing of permits and environmental impact reports for a construction project consisting of facilities, processing units, or equipment necessary to produce Phase 3 reformulated gasoline, as defined, thereby imposing a state-mandated local program.

(5) Existing law requires a person who digs, bores, or drills a water well, cathodic protection well, or a monitoring well, or abandons or destroys a well, or deepens or reperforates a well, to file a report of

completion with the Department of Water Resources within 30 days after the construction or alteration is completed. Under existing law, those reports may not be made available to the public, except to a person who obtains a written authorization from the owner of the well.

This bill would also allow a person performing an environmental cleanup study under order from a regulatory agency to obtain a report with regard to specified wells.

(6) Under existing law, until January 1, 2002, the State Department of Health Services is authorized to expend the money in the Drinking Water Treatment and Research Fund in the State Treasury to make payments to public water systems for the costs of treating contaminated groundwater and surface water for drinking water purposes, investigating contamination, acquiring alternate drinking water supplies, and for conducting research into treatment technologies. Existing law, operative June 30, 1999, requires the board to annually transfer $5,000,000, from June 30, 1999, until January 1, 2002, from the Underground Storage Tank Cleanup Fund to the drinking water fund for expenditure for those purposes, if a public drinking water well has been contaminated by an oxygenate and there is substantial evidence that the contamination was caused by a release from an underground storage tank.

This bill would extend the operation of the provision providing for the transfer of those funds from January 1, 2002, to January 1, 2010.

The bill would require the board to transfer $5,000,000 from the Underground Storage Tank Cleanup Fund to the drinking water fund, if the department makes a specified determination.

(7) Existing law, until December 22, 2005, or except as specified, requires the Trade and Commerce Agency to conduct a program to make loans to small businesses to upgrade, replace, or remove petroleum underground storage tanks to meet applicable local, state, or federal standards and to take corrective actions. Under existing law, funds in the Petroleum Underground Storage Tank Financing Account in the General Fund are continuously appropriated to the agency, without regard to fiscal year, for making these loans. Existing law specifies that the maximum amount of a loan is $750,000, but provides that, if at least $6,500,000 is not transferred to the account each fiscal year, the maximum amount of a loan is $350,000 an applicant is restricted to one loan at any one time.

This bill would delete the contingency provision thereby decreasing the maximum amount of a loan and restricting an applicant to one loan at any one time. The bill would additionally authorize the agency to conduct a grant program to assist small businesses to comply with the new requirements imposed by the bill on petroleum underground storage tanks and tanks with single-walled components that are located, as specified. The bill would specify eligibility requirements for grant applicants and the maximum amount of those grants. The bill would require the agency, on or before April 1, 2001, to submit a report to the Legislature detailing the status of the grant program.

The bill would authorize the agency to expend the money in the Petroleum Underground Storage Tank Financing Account, upon appropriation by the Legislature, to make those grants.

(8) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for specified reasons.

The people of the State of California do enact as follows:

SECTION 1. Section 15399.10 of the Government Code is amended to read:

15399.10. For purposes of this chapter, the following terms have the following meaning:

(a) "Agency" means the Trade and Commerce Agency.

(b) "Board" means the State Water Resources Control Board.

(c) "Loan applicant" means a small business that applies to the agency for a loan pursuant to this chapter.

(d) "Grant applicant" means a small business that applies to the agency for a grant pursuant to this chapter.

(e) "Tank" means an underground storage tank, as defined in Section 25281 of the Health and Safety Code, used for the purpose of storing petroleum, as defined in Section 25299.22 of the Health and Safety Code. "Tank" also includes under-dispenser containment systems, spill containment systems, enhanced monitoring and control systems, and vapor recovery systems and dispensers connected to the underground piping and the underground storage tank.

(f) "Project tank" means one or more tanks that would be upgraded, replaced, or removed with loan or grant funds.

SEC. 2. Section 15399.11 of the Government Code is amended to read:

15399.11. The agency shall conduct a loan program pursuant to this chapter, to assist small businesses in upgrading, replacing, or removing tanks to meet applicable local, state, or federal standards. Loan funds may also be used for corrective actions, as defined in Section 25299.14 of the Health and Safety Code. The agency shall also conduct a grant program, pursuant to this chapter, to assist small businesses to comply with Sections 25284.1 and 25292.4 of the Health and Safety Code.

SEC. 3. Section 15399.14 of the Government Code is amended to read:

15399.14. (a) The minimum amount that the agency may loan an applicant is ten thousand dollars ($10,000), and the maximum amount that the agency may loan an applicant is seven hundred fifty thousand dollars ($750,000).

(b) The term of the loan shall be for a maximum of 20 years if secured by real property, and for 10 years if not secured by real property. The interest rate for loans shall be set at the rate earned by the Surplus Money Investment Fund at the time of the loan commitment.

(c) Loan funds may be used to finance up to 100 percent of the costs necessary to upgrade, remove, or replace project tanks, including corrective actions, to meet applicable local, state, or federal standards, including, but not limited to, any design, construction, monitoring, operation, or maintenance requirements adopted pursuant to Sections 25284.1 and 25292.4 of the Health and Safety Code.

(d) The repeal of this chapter pursuant to Section 15399.21 shall not extinguish a loan obligation and shall not impair the deed of trust or other collateral made pursuant to this chapter or the authority of the state to pursue appropriate action for collection.

(e) The agency may charge a loan fee to loan applicants of up to 2 percent of the requested loan amount. The loan fee shall be deposited in the Petroleum Financing Collection Account.

SEC. 4. Section 15399.15 is added to the Government Code, to read:

15399.15. (a) The agency shall make grant funds available from the Petroleum Underground Storage Tank Financing Account to eligible grant applicants who meet all of the following eligibility requirements:

(1) The grant applicant is a small business, pursuant to the following requirements:

(A) The grant applicant meets the conditions for a small business as defined in Section 632 of Title 15 of the United States Code, and in the federal regulations adopted to implement that section, as specified in Section 121.2 of Title 13 of the Code of Federal Regulations.

(B) The grant applicant employs fewer than 20 full-time and part-time employees, is independently owned and operated, and is not dominant in its field of operation.

(2) The principal office of the grant applicant is domiciled in the state, and the officers of the grant applicant are domiciled in this state.

(3) The grant applicant, the applicant's family, or an affiliated entity, has owned or operated the project tank since January 1, 1997.

(4) All tanks owned and operated by the grant applicant are subject to compliance with Chapter 6.7 (commencing with Section

25280) of Division 20 of the Health and Safety Code, and the regulations adopted pursuant to that chapter.

(5) The facility where the project tank is located has sold at retail less than 900,000 gallons of gasoline annually for each of the two years preceding the submission of the grant application. The numbers of gallons sold shall be based upon taxable sales figures provided to the State Board of Equalization for that facility.

(6) The grant applicant owns or operates a tank that is in compliance with Section 25291 of the Health and Safety Code, or subdivisions (d) and (e) of Section 25292, of the Health and Safety Code, and the regulations adopted to implement those sections.

(7) The grant applicant has acquired debt, or is currently making *payments on a preexisting loan, to upgrade the grant applicant's* underground storage tanks to meet state and federal requirements prior to the December 22, 1998, deadline.

(8) The facility where the project tank is located was legally in business retailing gasoline after January 1, 1999.

(b) Grant funds may only be used to pay the costs necessary to comply with the requirements of Section 25284.1 or 25292.4, or both, of the Health and Safety Code.

(c) If the total amount of grant requests by eligible grant applicants to the agency pursuant to this section exceed, or are anticipated to exceed, the amount in the Petroleum Underground Storage Tank Financing Account, the agency may adopt a priority ranking list to award grants based upon the level of demonstrated financial hardship of the eligible grant applicant, or the relative impact upon the local community where the project tank is located if the claim is denied.

SEC. 5. Section 15399.15.1 is added to the Government Code, to read:

15399.15.1. A complete grant application shall include all of the following information:

(a) Evidence of eligibility.

(b) Financial and legal documents necessary to demonstrate the applicant's financial hardship, if any. The agency shall develop a standard list of documents required of all applicants, and may also request from individual applicants additional financial and legal documents not provided on this list.

(c) An explanation of the actions the applicant is required to take comply with the requirements of Sections 25284.1 and 25292.4 of the Health and Safety Code.

(d) A detailed cost estimate of the actions that are required to be completed for the project tanks to comply with applicable local, state, or federal standards.

(e) Any other information that the department determines to be necessary to include in an application form.

SEC. 6. Section 15399.15.2 is added to the Government Code, to read:

15399.15.2. (a) (1) The minimum amount that the agency may grant an applicant is ten thousand dollars ($10,000), and the maximum amount that the agency may grant an applicant is fifty thousand dollars ($50,000).

(b) Grant funds may be used to finance up to 100 percent of the costs necessary to upgrade project tanks to comply with Sections 25284.1 and 25292.4 of the Health and Safety Code. No person or entity is eligible to receive more than fifty thousand dollars ($50,000) in grant funds pursuant to this chapter.

SEC. 7. Section 15399.17 of the Government Code is amended to read:

15399.17. (a) The Petroleum Underground Storage Tank Financing Account is hereby created in the General Fund. The Petroleum Underground Storage Tank Financing Account is created for both of the following purposes:

(1) Receiving federal, state, and local money.

(2) Receiving repayments of loans and interest and late fees on those accounts.

(b) (1) Notwithstanding Section 13340, the funds deposited into the account are hereby continuously appropriated to the agency without regard to fiscal year for making loans pursuant to this chapter.

(2) The funds deposited in the account may be expended by the agency to make grants pursuant to this chapter, upon appropriation by the Legislature.

(c) The agency shall annually make available not more than 33 percent of the available funds from the account for the purposes of providing grants pursuant to this chapter.

(d) Notwithstanding Section 16305.7, all interest or other increments resulting from the investment of the funds in the Petroleum Underground Storage Tank Financing Account pursuant to Article 4 (commencing with Section 16470) of Chapter 3 of Part 2 of Division 4 of Title 2 shall be deposited in the Petroleum Underground Storage Tank Financing Account.

(e) All interest accruing on interest payments from loan applicants or interest earned on the funds in the Petroleum Underground Storage Tank Financing Account shall be deposited in a subaccount of the account.

SEC. 8. Section 15399.19 of the Government Code, as added by Section 6 of Chapter 814 of the Statutes of 1995, is amended and renumbered to read:

15399.19.1. (a) On or before January 1, 1997, and on or before January 1 annually thereafter, the agency shall submit an annual report to the Legislature concerning the performance of the grant and loan program established by this chapter, including the number and size of grants and loans made, characteristics of grant and loan recipients, the number of underground storage tanks removed and upgraded as a result of the grant and loan program, and the amount of money spent on administering the program. Copies of the report shall be submitted to the appropriate fiscal and policy committees of the Legislature and, upon request, to individual Members of the Legislature.

(b) Notwithstanding Section 7550.5 of the Government Code, on or before April 1, 2001, the agency shall submit a report to the Legislature detailing the status of the grant program, the remaining needs, if any, of eligible candidates for financial assistance from the account, and any suggested statutory changes so that the account may better serve affected small businesses.

SEC. 9. Section 65964 is added to the Government Code, to read:

65964. (a) For the purposes of this section, the following definitions apply:

(1) "Permitting agency" means a city or county, or an air pollution control district, as defined in Section 65926, authorized to issue a permit or other preconstruction authorization to construct a Phase 3 reformulated gasoline project.

(2) "Phase 3 Reformulated Gasoline Project" means a project to construct or modify a facility consisting of processing units or other equipment necessary to produce California Phase 3 Reformulated Gasoline, as required to be produced pursuant to paragraph 6 of Executive Order D-5-99, and that is located within the physical boundaries of an existing oil refinery or terminal.

(b) A permitting agency for a phase 3 reformulated gasoline project shall undertake all reasonable efforts to expedite action on the permit or other authorization with the objective of acting upon the permit or other authorization within 12 months of receiving a completed application for a permit or other authorization, if the permit applicant has made reasonable efforts to cooperate with the permitting agency in expediting the processing of the permit or other authorization.

(c) The permitting agency, or a permit applicant with the concurrence of the permitting agency, may request the State Air Resources Board or the State Energy Resources Conservation and Development Commission, or both agencies, to provide appropriate assistance to the permitting agency to assist that agency in achieving the objective of acting upon the permit or other authorization within 12 months.

(d) Upon receipt of a request made pursuant to subdivision (c), the State Air Resources Board or the State Energy Resources Conservation and Development Commission, or both agencies, shall provide appropriate assistance to a permitting agency with the objective of acting upon a permit for a phase 3 reformulated gasoline project within 12 months.

(e) Nothing in this section shall affect any of the following:

(1) The authority or obligation of a public agency under any law, regulation, or ordinance.

(2) The ability of a public agency to hold a public hearing upon, to comment upon, or to impose conditions upon, a reformulated gasoline project.

(3) The rights or remedies of any party pursuant to any law, regulation, or ordinance.

(f) This section shall remain in effect only until January 1, 2003, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2003, deletes or extends that date.

SEC. 10. Section 25284.1 is added to the Health and Safety Code, to read:

25284.1. (a) The board shall take all of the following actions with regard to the prevention of unauthorized releases from petroleum underground storage tanks:

(1) On or before June 1, 2000, initiate a field-based research program to quantify the probability and environmental significance of releases from underground storage tank systems meeting the 1998 upgrade requirements specified in subdivision (c) of Section 25284. The research program shall do all of the following:

(A) Seek to identify the source and causes of releases and any deficiencies in leak detection systems.

(B) Include single-walled, double-walled, and hybrid tank systems, and avoid bias toward known leaking underground storage tank systems by including a statistically valid sample of all operating underground storage tank systems.

(C) Include peer review.

(2) Complete the research program on or before June 1, 2002.

(3) Use the results of the research program to develop appropriate changes in design, construction, monitoring, operation, and maintenance requirements for tank systems.

(4) On or before January 1, 2001, adopt regulations to do all of the following:

(A) (i) Require underground storage tank owners, operators, service technicians, installers, and inspectors to meet minimum industry-established training standards and require tank facilities to be operated in a manner consistent with industry-established best management practices.

(ii) The board shall implement an outreach effort to educate small business owners or operators on the importance of the regulations adopted pursuant to this subparagraph.

(B) Require testing of the secondary containment components, including under-dispenser and pump turbine containment components, upon initial installation of a secondary containment component and periodically thereafter, to ensure that the system is capable of containing releases from the primary containment until a release is detected and cleaned up. The board shall consult with the petroleum industry and local government to assess the appropriate test or tests that would comply with this subparagraph.

(C) Require *annual testing of release detection sensors and* alarms, including under-dispenser and pump turbine containment sensors and alarms. The board shall consult with the petroleum industry and local government to assess the appropriate test or tests that would comply with this subparagraph.

(5) (A) Require an owner or operator of an underground storage tank installed after July 1, 1987, if a tank is located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping data base, to have the underground storage tank system fitted, on or before July 1, 2001, with under-dispenser containment or a spill containment or control system that is approved by the board as capable of containing any accidental release.

(B) Require all underground storage tanks installed after January 1, 2000, to have the tank system fitted with under-dispenser containment or a spill containment system or control system to meet the requirements of subparagraph (A).

(C) Require an owner or operator of an underground storage tank that is not otherwise subject to subparagraph (A), and not subject to *subparagraph (B), to have the underground storage tank system* fitted to meet the requirements of subparagraph (A), on or before December 31, 2003.

(D) On and after January 1, 2002, no person shall install, repair, maintain, or calibrate monitoring equipment for an underground storage tank unless that person satisfies both of the following requirements:

(i) The person has fulfilled training standards identified by the board in regulations adopted pursuant to this section.

(ii) The person possesses a Class "A" General Engineering Contractor License, C-10 Electrical Contractor License, C-34 Pipeline Contractor License, C-36 Plumbing Contractor License, or C-61 (D40) Limited Specialty Service Station Equipment and Maintenance Contractor License issued by the Contractors' State License Board.

(E) Loans and grants for the installation of under-dispenser containment or a spill containment or control system shall be made available pursuant to Chapter 8.5 (commencing with Section *15399.10) of Part 6.7 of Division 3 of Title 2 of the Government Code.*

(6) Convene a panel of local agency and regional board representatives to review existing enforcement authority and procedures and to advise the board of any changes that are needed to enable local agencies to take adequate enforcement action against owners and operators of noncompliant underground storage tank facilities. The panel shall make its recommendations to the board on or before September 30, 2001. Based on the recommendations of the

panel, the board shall also establish effective enforcement procedures in cases involving fraud.

(b) On or before July 1, 2001, the Contractors State License Board, in consultation with the board, the petroleum industry, air pollution control districts, air quality management districts, and local government, shall review its requirements for petroleum underground storage tank system installation and removal contractors and make changes, where appropriate, to ensure these contractors are qualified.

SEC. 11. Section 25288 of the Health and Safety Code is amended to read:

25288. (a) The local agency shall inspect every underground tank system within its jurisdiction at least once every year. The purpose of the inspection is to determine whether the tank system complies with the applicable requirements of this chapter and the regulations adopted by the board pursuant to Section 25299.3, including the design and construction standards of Section 25291 or 25292, whichever is applicable, whether the operator has monitored and tested the tank system as required by the permit, and whether the tank system is in a safe operating condition.

(b) After an inspection conducted pursuant to subdivision (a), the local agency shall prepare a compliance report detailing the inspection and shall send a copy of this report to the permitholder and the owner or operator, if the owner or operator is not the permitholder. Any report prepared pursuant to this section shall be consolidated into any other inspection reports required pursuant to Chapter 6.11 (commencing with Section 25404), the requirements listed in subdivision (c) of Section 25404, and the regulations adopted to implement the requirements listed in subdivision (c) of Section 25404.

(c) In lieu of the annual local agency inspections, the local agency may require the permitholder to employ a special inspector to conduct the annual inspection. The local agency shall supply the permitholder with a list of at least three special inspectors that are qualified to conduct the inspection. The permitholder shall employ a special inspector from the list provided by the local agency. The special inspector's authority shall be the same as that of the local agency as set forth in subdivision (a).

(d) Within 60 days after receiving a compliance report or special inspection report prepared in accordance with subdivision (b) or (c), respectively, the permitholder shall file with the local agency a plan to implement all recommendations contained in the compliance report or shall demonstrate, to the satisfaction of the local agency, why these recommendations should not be implemented. Any corrective action conducted pursuant to the recommendations in the report shall be taken pursuant to Sections 25299.36 and 25299.37.

SEC. 12. Section 25292.4 is added to the Health and Safety Code, to read:

25292.4. (a) On and after November 1, 2000, an owner or operator of an underground storage tank system with a single-walled component that is located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping data base, shall implement a program of enhanced leak detection or monitoring, in accordance with the regulations adopted by the board pursuant to subdivision (c).

(b) The board shall notify the owner and operator of each underground storage tank system that is located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS *mapping data base, of the owner and operators' responsibilities* pursuant to this section. The board shall provide each local agency with a list of tank systems within the local agency's jurisdiction that are located within 1,000 feet of a public drinking water well, as identified pursuant to the state GIS mapping data base.

(c) The board shall adopt regulations to implement the enhanced leak detection and monitoring program required by subdivision (a). Before adopting these regulations, the board shall consult with the petroleum industry, local governments, environmental groups, and other interested parties to assess the appropriate technology and procedures to implement the enhanced leak detection or monitoring program required by subdivision (a). In adopting these regulations, the board shall consider existing leak detection technology and external monitoring techniques or procedures for underground storage tanks.

SEC. 13. Section 25299 of the Health and Safety Code is amended to read:

25299. (a) Any operator of an underground tank system shall be liable for a civil penalty of not less than five hundred dollars ($500) or more than five thousand dollars ($5,000) for each underground storage tank for each day of violation for any of the following violations:

(1) Operating an underground tank system which has not been issued a permit, in violation of this chapter.

(2) Violation of any of the applicable requirements of the permit issued for the operation of the underground tank system.

(3) Failure to maintain records, as required by this chapter.

(4) Failure to report an unauthorized release, as required by Sections 25294 and 25295.

(5) Failure to properly close an underground tank system, as required by Section 25298.

(6) Violation of any applicable requirement of this chapter or any requirement of this chapter or any regulation adopted by the board pursuant to Section 25299.3.

(7) Failure to permit inspection or to perform any monitoring, testing, or reporting required pursuant to Section 25288 or 25289.

(8) Making any false statement, representation, or certification in any application, record, report, or other document submitted or required to be maintained pursuant to this chapter.

(9) Tampering with or otherwise disabling automatic leak detection devices or alarms.

(b) Any owner of an underground tank system shall be liable for a civil penalty of not less than five hundred dollars ($500) or more than five thousand dollars ($5,000) per day for each underground storage tank, for each day of violation, for any of the following violations:

(1) Failure to obtain a permit as specified by this chapter.

(2) Failure to repair or upgrade an underground tank system in accordance with this chapter.

(3) Abandonment or improper closure of any underground tank system subject to this chapter.

(4) Knowing failure to take reasonable and necessary steps to assure compliance with this chapter by the operator of an underground tank system.

(5) Violation of any applicable requirement of the permit issued for operation of the underground tank system.

(6) Violation of any applicable requirement of this chapter or any regulation adopted by the board pursuant to Section 25299.3.

(7) Failure to permit inspection or to perform any monitoring, testing, or reporting required pursuant to Section 25288 or 25289.

(8) Making any false statement, representation, or certification in any application, record, report, or other document submitted or required to be maintained pursuant to this chapter.

(c) Any person who intentionally fails to notify the board or the local agency when required to do so by this chapter or who submits false information in a permit application, amendment, or renewal, pursuant to Section 25286, is liable for a civil penalty of not more than five thousand dollars ($5,000) for each underground storage tank for which notification is not given or false information is submitted.

(d) (1) Any person who falsifies any monitoring records required by this chapter, or knowingly fails to report an unauthorized release, shall, upon conviction, be punished by a fine of not less than five thousand dollars ($5,000) or more than ten thousand dollars ($10,000), by imprisonment in the county jail for not to exceed one year, or by both that fine and imprisonment.

(2) Any person who intentionally disables or tampers with an automatic leak detection system in a manner that would prevent the automatic leak detection system from detecting a leak or alerting the owner or operator of the leak, shall, upon conviction, be punished by a fine of not less than five thousand dollars ($5,000) or more than ten

thousand dollars ($10,000), by imprisonment in the county jail for not more than one year, or by both the fine and imprisonment.

(e) In determining both the civil and criminal penalties imposed pursuant to this section, the court shall consider all relevant circumstances, including, but not limited to, the extent of harm or potential harm caused by the violation, the nature of the violation and the period of time over which it occurred, the frequency of past violations, and the corrective action, if any, taken by the person who holds the permit.

(f) Each civil penalty or criminal fine imposed pursuant to this section for any separate violation shall be separate, and in addition to, any other civil penalty or criminal fine imposed pursuant to this section or any other provision of law, and shall be paid to the treasury of the local agency or state, whichever is represented by the office of the city attorney, district attorney, or Attorney General bringing the action. All penalties or fines collected on behalf of the board or a regional board by the Attorney General shall be deposited in the State Water Pollution Cleanup and Abatement Account in the State Water Quality Control Fund, and are available for expenditure by the board, upon appropriation, pursuant to Section 13441 of the Water Code.

(g) Paragraph (9) of subdivision (a) does not prohibit the owner or operator of an underground storage tank, or his or her designee, from maintaining, repairing, or replacing automatic leak detection devices or alarms associated with that tank.

SEC. 14. Section 29299.18 is added to the Health and Safety Code, to read:

25299.18. "MTBE" means methyl tertiary-butyl ether.

SEC. 15. Section 25299.37.1 of the Health and Safety Code is amended to read:

25299.37.1. (a) No closure letter pursuant to this chapter shall be issued unless the soil or groundwater, or both, where applicable, at the site have been tested for MTBE and the results of that testing are known to the regional board.

(b) Subdivision (a) does not apply to a closure letter for a tank case for which the board, a regional board, or local agency determines that the tank has only contained diesel or jet fuel.

SEC. 16. Section 25299.38.1 is added to the Health and Safety Code, to read:

25299.38.1. (a) The board, in consultation with the State Department of Health Services, shall develop guidelines for the investigation and cleanup of MTBE and other ether-based oxygenates in groundwater. The guidelines shall include procedures for determining, to the extent practicable, whether the contamination associated with an unauthorized release of MTBE is from the tank system prior to the system's most recent upgrade or replacement or if the contamination is from an unauthorized release from the current tank system.

(b) The board, in consultation with the State Department of Health Services, shall develop appropriate cleanup standards for contamination associated with a release of MTBE.

SEC. 17. Section 25299.50 of the Health and Safety Code is amended to read:

25299.50. (a) The Underground Storage Tank Cleanup Fund is hereby created in the State Treasury. The money in the fund may be expended by the board, upon appropriation by the Legislature, for purposes of this chapter. From time to time, the board may modify existing accounts or create accounts in the fund or other funds administered by the board, which the board determines are appropriate or necessary for proper administration of this chapter.

(b) Except for funds transferred to the Drinking Water Treatment and Research Fund created pursuant to subdivision (c) of Section 116367, all of the following amounts shall be deposited in the fund:

(1) Money appropriated by the Legislature for deposit in the fund.

(2) The fees, interest, and penalties collected pursuant to Article 5 (commencing with Section 25299.40).

(3) Notwithstanding Section 16475 of the Government Code, any interest earned upon the money deposited in the fund.

(4) Any money recovered by the fund pursuant to Section 25299.70.

(5) Any civil penalties collected by the board or regional board pursuant to Section 25299.76.

(c) (1) Notwithstanding subdivision (a), any funds appropriated by the Legislature in the annual Budget Act for payment of a claim for the costs of a corrective action in response to an unauthorized release, that are encumbered for expenditure for a corrective action pursuant to a letter of credit issued by the board pursuant to subdivision (e) of Section 25299.57, but are subsequently not expended for that corrective action claim, may be reallocated by the board for payment of other claims for corrective action pursuant to Section 25299.57.

(2) Notwithstanding Section 7550.5 of the Government Code, the board shall report at least once every three months on the implementation of this subdivision to the Senate Committee on Budget and Fiscal Review, the Senate Committee on Environmental Quality, the Assembly Committee on Budget, and the Assembly Committee on Environmental Safety and Toxic Materials, or to any successor committee, and to the Director of Finance.

SEC. 18. Section 25299.51 of the Health and Safety Code is amended to read:

25299.51. The board may expend the money in the fund for all the following purposes:

(a) In addition to the purposes specified in subdivisions (c), (d), and (e), for expenditure by the board for the costs of implementing this chapter, which shall include costs incurred by the board pursuant to Article 8.5 (commencing with Section 25299.80.1).

(b) To pay for the administrative costs of the State Board of Equalization in collecting the fee imposed by Article 5 (commencing with Section 25299.40).

(c) To pay for the reasonable and necessary costs of the regional board or local agency for corrective action pursuant to Section 25299.36, up to one million five hundred thousand dollars ($1,500,000) per occurrence. The Legislature may appropriate the money in the fund for expenditure by the board, without regard to fiscal year, for prompt action in response to any unauthorized release.

(d) To pay for the costs of an agreement for the abatement of, and oversight of the abatement of, an unauthorized release of hazardous substances from underground storage tanks, by a local agency, as authorized by Section 25297.1 or by any other provision of law, except that, for the purpose of expenditure of these funds, only underground storage tanks, as defined in Section 25299.24, shall be the subject of the agreement.

(e) To pay for the costs of cleanup and oversight of unauthorized releases at abandoned tank sites. The board shall not expend more than 25 percent of the total amount of money collected and deposited in the fund annually for the purposes of this subdivision and subdivision (h).

(f) To pay claims pursuant to Section 25299.57.

(g) To pay, upon order of the Controller, for refunds pursuant to Part 26 (commencing with Section 50101) of Division 2 of the Revenue and Taxation Code.

(h) To pay for the reasonable and necessary costs of the regional board or the local agency for corrective action pursuant to subdivision (g) of Section 25299.37.

(i) To pay claims pursuant to Section 25299.58.

SEC. 19. Section 25299.52 of the Health and Safety Code is amended to read:

25299.52. (a) The board shall adopt a priority ranking list at least annually for awarding claims pursuant to Section 25299.57 or 25299.58. Any owner or operator eligible for payment of a claim pursuant to Section 25299.54 shall file an application with the board within a reasonable period, to be determined by the board, prior to adoption of the priority ranking list.

(b) Except as provided in subdivision (c), in awarding claims pursuant to Section 25299.57 or 25299.58, the board shall pay claims in accordance with the following order of priority:

(1) Owners of tanks who are eligible to file a claim pursuant to subdivision (e) of Section 25299.54.

(2) Owners and operators of tanks that are either of the following:

(A) An owner or operator of a tank that is a small business, by meeting the requirements of subdivision (d) of Section 14837 of the Government Code. An owner or operator that meets that definition of small business, but who is domiciled or has its principal office outside of the state, shall be classified in this category if the owner or operator otherwise meets the requirements of subdivision (d) of Section 14837 of the Government Code with regard to the number of employees and the total annual revenues received.

(B) An owner or operator that is a city, county, district, or nonprofit organization that receives total annual revenues of not more than seven million dollars ($7,000,000). In determining the amount of a nonprofit organization's annual revenues, the board shall calculate only those revenues directly attributable to the particular site at which the tank or tanks for which the claim is submitted are located.

(3) Owners or operators of tanks that are either of the following:

(A) The owner or operator owns and operates a business that employs fewer than 500 full-time and part-time employees, is independently owned and operated, and is not dominant in its field of operation.

(B) The owner or operator is a city, county, district, or nonprofit organization that employs fewer than 500 full-time and part-time employees. In determining the number of employees employed by a nonprofit organization, the board shall calculate only those employees employed at the particular site at which a tank for which the claim is being submitted is located.

(4) All other tank owners and operators.

(c) (1) In any year in which the board is not otherwise authorized to award at least 15 percent of the total amount of funds committed for that year to tank owners or operators in those categories set forth in paragraph (3) or (4) of subdivision (b) due to the priority ranking list award limitations set forth in subdivision (b), the board shall allocate between 14 and 16 percent of the total amount of funds committed for that year to each category that is not otherwise entitled to at least that level of committed funding for that year.

(2) If the total amount of claims outstanding in one or more of the priority categories specified in paragraph (3) or (4) of subdivision (b) is less than 15 percent of the total amount annually appropriated from the fund for the purpose of awarding claims, the board shall reserve for making claims in that category only the amount that is necessary to satisfy the outstanding claims in that category.

(d) The board shall give priority to a claim that is filed before September 24, 1993, by a city, county, or district that is eligible for payment pursuant to Section 25299.54 in the following manner:

(1) The board shall determine whether the priority category specified for a city, county, or district pursuant to subparagraph (B) of paragraph (2), or pursuant to subparagraph (B) of paragraph (3),

of subdivision (b) requires that the priority ranking of the claim be changed.

(2) If the priority ranking of the claim is changed and the claim is placed into either the priority category specified in subparagraph (B) of paragraph (2), or specified in subparagraph (B) of paragraph (3), of subdivision (b), the board shall pay all other claims that were assigned to that priority category prior to January 1, 2000, before paying the claim of the city, county, or district.

(e) The board may, to carry out the intent specified in paragraph (1) of subdivision (b) of Section 25299.10 and to expedite the processing and awarding of claims pursuant to Sections 25299.57 and 25299.58, implement the contracting procedures required by Chapter 10 (commencing with Section 4525) of Division 5 of Title 1 of the Government Code, as may be necessary, to alleviate the claims processing and award backlog. If, at the conclusion of any fiscal year, 25 percent or more of the funds appropriated annually for awards to claimants during that year have not actually been obligated by the board, the board shall, at its next regularly scheduled meeting, determine, in a public hearing, whether, given the circumstances of the awards backlog, it is appropriate to implement those contracting procedures for some, or all, of the claims filed with the board.

(f) For purposes of this section, the following definitions shall apply:

(1) "Nonprofit organization" means a nonprofit public benefit organization incorporated pursuant to Part 2 (commencing with Section 5110) of Division 2 of Title 1 of the Corporations Code.

(2) "Annual revenue," with respect to public entities, means the total annual general purpose revenues, excluding all restricted revenues over which the governing agency has no discretion, as reported in the Annual Report of Financial Transactions submitted to the Controller, for the latest fiscal year ending prior to the date the fund reimbursement claim application was filed.

(3) "Annual revenue," with respect to nonprofit organizations, means the total annual revenues, as shown in an annual fiscal report filed with the Registry of Charitable Trusts of state and federal tax records, based on the latest fiscal year ending prior to the date the fund reimbursement claim application was filed.

(4) "General purpose revenues," as used in paragraph (2), means revenues consisting of all of the following: secured and unsecured revenues; *less than countywide funds, secured and unsecured; prior* year secured and unsecured penalties and delinquent taxes; sales and use taxes; transportation taxes (nontransit); property transfer taxes; transient lodging taxes; timber yield taxes; aircraft taxes; franchise taxes; fines, forfeitures, and penalties; revenues from use of money and property; motor vehicle in-lieu taxes; trailer coach in-lieu taxes; homeowner property tax relief; open-space tax relief; and cigarette taxes.

SEC. 20. Section 25299.57 of the Health and Safety Code is amended to read:

25299.57. (a) If the board makes the determination specified in subdivision (d), the board may only pay for the costs of a corrective action that exceeds the level of financial responsibility required to be obtained pursuant to Section 25299.32, but not more than one million five hundred thousand dollars ($1,500,000) for each occurrence. In the case of an owner or operator who, as of January 1, 1988, was required to perform corrective action, who initiated that corrective action in accordance with Division 7 (commencing with Section 13000) of the Water Code or Chapter 6.7 (commencing with Section 25280), and who is undertaking the corrective action in compliance with waste discharge requirements or other orders issued pursuant to Division 7 (commencing with Section 13000) of the Water Code or Chapter 6.7 (commencing with Section 25280), the owner or operator may apply to the board for satisfaction of a claim filed pursuant to this article. It is the intent of the Legislature that claimants applying for satisfaction of claims from the fund be notified of eligibility for reimbursement in a prompt and timely manner and that a letter of credit or commitment that will obligate funds for reimbursement follow the notice of eligibility as soon thereafter as possible.

(b) (1) For claims eligible for reimbursement pursuant to subdivision (c) of Section 25299.55, the claimant shall submit the actual cost of corrective action to the board, which shall either approve or disapprove the costs incurred as reasonable and necessary.

(2) The board shall not reject any actual costs of corrective action in a claim solely on the basis that the invoices submitted fail to sufficiently detail the actual costs incurred, if all of the following applies:

(A) Auxiliary documentation is provided which documents to the board's satisfaction that the invoice is for necessary corrective action work.

(B) The costs of corrective action work in the claim are reasonably commensurate with similar corrective action work performed during the same time period covered by the invoice for which reimbursement is sought.

(C) The invoices include a brief description of the work performed, the date that the work was performed, the vendor, and the amount.

(c) For claims eligible for prepayment pursuant to subdivision (c) of Section 25299.55, the claimant shall submit the estimated cost of the corrective action to the board, which shall approve or disapprove the reasonableness of the cost estimate.

(d) Except as provided in subdivision (j), a claim specified in subdivision (a) may be paid if the board makes all of the following findings:

(1) There has been an unauthorized release of petroleum into the environment from an underground storage tank.

(2) The claimant is required to undertake or contract for corrective action pursuant to Section 25299.37, or, as of January 1, 1988, the claimant has initiated corrective action in accordance with Division 7 (commencing with Section 13000) of the Water Code.

(3) (A) Except as provided in subparagraph (B), the claimant has complied with Section 25299.31 and the permit requirements of Chapter 6.7 (commencing with Section 25280).

(B) All claimants who file their claim on or after January 1, 1994, and all claimants who filed their claim prior to that date but are not eligible for a waiver of the permit requirement pursuant to board regulations in effect on the date of the filing of the claim, and who did not obtain or apply for any permit required by subdivision (a) of Section 25284 by January 1, 1990, shall be subject to subparagraph (A) regardless of the reason or reasons that the permit was not obtained or applied for. However, on and after January 1, 1994, the board may waive the provisions of subparagraph (A) as a condition for payment from the fund if the board finds all of the following:

(i) The claimant was unaware of the permit requirement prior to January 1, 1990, and there was no intent to intentionally avoid the permit requirement or the fees associated with the permit.

(ii) Prior to submittal of the application to the fund, the claimant has complied with Section 25299.31 and has obtained and paid for all permits currently required by this paragraph.

(iii) Prior to submittal of the application to the fund, the claimant has paid all current underground storage tank fees imposed pursuant to Section 25299.41 and all prior fees due on and after January 1, 1991.

(C) (i) A claimant exempted pursuant to subparagraph (B) shall obtain a level of financial responsibility twice as great as the amount which the claimant is otherwise required to obtain pursuant to subdivision (a) of Section 25299.32.

(ii) The board may waive the requirements of clause (i) if the claimant can demonstrate that the conditions specified in clauses (i) to (iii), inclusive, of subparagraph (B) were satisfied prior to the causing of any contamination. That demonstration may be made through a certification issued by the permitting agency based on site and tank tests at the time of permit application or in any other manner acceptable to the board.

(D) The board shall rank all claims resubmitted pursuant to subparagraph (B) lower than all claims filed before January 1, 1994, within their respective priority classes specified in subdivision (b) of Section 25299.52.

(4) The board has approved either the costs incurred for the corrective action pursuant to subdivision (b) or the estimated costs for corrective action pursuant to subdivision (c).

(e) The board shall provide the claimant, whose cost estimate has been approved, a letter of credit authorizing payment of the costs from the fund.

(f) The claimant may submit a claim for partial payment to cover the costs of corrective action performed in stages, as approved by the board.

(g) (1) Any claimant who submits a claim for payment to the board shall submit multiple bids for prospective costs as prescribed in regulations adopted by the board pursuant to Section 25299.77.

(2) Any claimant who submits a claim to the board for the payment of professional engineering and geologic work shall submit multiple proposals and fee estimates, as required by the regulations adopted by the board pursuant to Section 25299.77. The claimant's selection of the provider of these services is not required to be based on the lowest estimated fee, if the fee estimate conforms with the range of acceptable costs established by the board.

(3) Any claimant who submits a claim for payment to the board for remediation construction contracting work shall submit multiple bids, as required in the regulations adopted by the board pursuant to Section 25299.77.

(4) Paragraphs (1), (2), and (3) do not apply to a tank owned or operated by a public agency if the prospective costs are for private professional services within the meaning of Chapter 10 (commencing with Section 4525) of Division 5 of Title 1 of the Government Code and those services are procured in accordance with the requirements of that chapter.

(h) The board shall provide, upon the request of a claimant, assistance to the claimant in the selection of contractors retained by the claimant to conduct reimbursable work related to corrective actions. The board shall develop a summary of expected costs for common remedial actions. This summary of expected costs may be used by claimants as a guide in the selection and supervision of consultants and contractors.

(i) The board shall pay, within 60 days from the date of receipt of an invoice of expenditures, all costs specified in the work plan developed pursuant to Section 25299.37, and all costs which are otherwise necessary to comply with an order issued by a local, state, or federal agency.

(j) (1) The board shall pay a claim of not more than three thousand dollars ($3,000) per occurrence for regulatory technical assistance to an owner or operator who is otherwise eligible for reimbursement under this chapter.

(2) For the purposes of this subdivision, regulatory technical assistance is limited to assistance from a person, other than the

claimant, in the preparation and submission of a claim to the fund. Regulatory technical assistance does not include assistance in connection with proceedings under Section 25299.39.2 or 25299.56 or any action in court.

(k) (1) Notwithstanding any other provision of this section, the board shall pay a claim for the costs of corrective action to a person who owns property on which is located a release from a petroleum underground storage tank which has been the subject of a completed corrective action and for which additional corrective action is required because of additionally discovered contamination from the previous release, only if the person who carried out the earlier and completed corrective action was eligible for, and applied for, reimbursement pursuant to subdivision (b), and only to the extent that the amount of reimbursement for the earlier corrective action did not exceed the amount of reimbursement authorized by subdivision (a). Reimbursement to a claimant on a reopened site shall occur when funds are available, and reimbursement commitment shall be made ahead of any new letters of commitment to be issued, as of the date of the reopening of the claim, if funding has occurred on the original claim, in which case funding shall occur at the time it would have occurred under the original claim.

(2) For purposes of this subdivision, a corrective action is completed when the local agency or regional board with jurisdiction over the site or the board issues a closure letter pursuant to subdivision (h) of Section 25299.37.

SEC. 21. Section 25299.59 of the Health and Safety Code is amended to read:

25299.59. (a) If the board has paid out of the fund for any costs of corrective action, the board shall not pay any other claim out of the fund for the same costs.

(b) Notwithstanding Sections 25299.57 and 25299.58, the board shall not reimburse or authorize prepayment of any claim in an aggregate amount exceeding one million five hundred thousand dollars ($1,500,000), less the minimum level of financial responsibility specified in Section 25299.32, for a claim arising from the same event or occurrence. If a claim exceeds one million dollars ($1,000,000) for an occurrence, the board may only reimburse costs submitted pursuant to Section 25299.57 for those costs in excess of one million dollars ($1,000,000).

(c) The board may conduct an audit of any corrective action claim honored pursuant to this chapter. The claimant shall reimburse the state for any costs disallowed in the audit. A claimant shall preserve, and make available, upon request of the board or the board's designee, all records pertaining to the corrective action claim for a period of three years after the final payment is made to the claimant.

SEC. 22. Section 25299.81 of the Health and Safety Code is amended to read:

25299.81. (a) Except as provided in subdivisions (b) and (c), this chapter shall remain in effect only until January 1, 2011, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2011, deletes or extends that date.

(b) Notwithstanding subdivision (a), Article 1 (commencing with Section 25299.10), Article 2 (commencing with Section 25299.11), and Article 4 (commencing with Section 25299.36) shall not be repealed and shall remain in effect on January 1, 2011.

(c) The repeal of certain portions of this chapter does not terminate any of the following rights, obligations, or authorities, or any provision necessary to carry out these rights and obligations:

(1) The filing and payment of claims against the fund, until the moneys in the fund are exhausted. Upon exhaustion of the fund, any remaining claims shall be invalid.

(2) The repayment of loans, outstanding as of January 1, 2011, due and payable to the board under the terms of Chapter 8.5 (commencing with Section 15399.10) of Part 6.7 of Division 3 of Title 2 of the Government Code.

(3) The resolution of any cost recovery action.

(d) Notwithstanding Section 7550.5 of the Government Code, the board shall annually,. on or before September 30, prepare and submit a report to the Legislature which describes the status of the fund and sets forth recommendations for legislative changes to improve the efficiency of the program established pursuant to this chapter, with a special emphasis on expediting environmental cleanup and the distribution of money from the fund, including alternative methods for the distribution of that money.

SEC. 23. Section 25299.94 of the Health and Safety Code is amended to read:

25299.94. (a) The board may pay the cost of corrective actions and third-party compensation claims that are submitted as part of a joint claim and which exceed the amount specified in subdivision (b), but do not exceed an amount equal to one million five hundred thousand dollars ($1,500,000) per occurrence, for which an owner or operator named in the joint claim is eligible for reimbursement under this chapter. If a claim from a contributing site exceeds one million dollars ($1,000,000) for an occurrence, the board may only reimburse costs submitted pursuant to Section 25299.57 for those costs in excess of one million dollars ($1,000,000).

(b) For each joint claim, the board may only pay for the costs of corrective action and third-party compensation claims that exceed the aggregate of the levels of financial responsibility required pursuant to Section 25299.32 for each owner or operator named in the joint claim.

(c) The costs of corrective action determined eligible for reimbursement shall be paid before third-party compensation claims.

(d) Except as provided in paragraph (1) of subdivision (e), reimbursement for costs of corrective action is limited to costs incurred by the joint claimants after executing an agreement under paragraph (7) of subdivision (a) of Section 25299.93.

(e) Both of the following costs of corrective action incurred at a contributing site may be reimbursed in accordance with subdivision (f):

(1) Costs incurred by an owner or operator before executing an agreement described in paragraph (7) of subdivision (a) of Section 25299.93.

(2) Costs relating to unauthorized releases that do not contribute to the commingled plume, but which are included in the occurrence which is the subject of the joint claim.

(f) An owner or operator may seek reimbursement of costs described in subdivision (e) by doing either of the following:

(1) Including a payment request for those corrective action costs with the claim filed under this article.

(2) Filing a claim or maintaining an existing claim under Article 6 (commencing with Section 25299.50).

(g) Any reimbursement received pursuant to subdivision (f) and any amount excluded from the payment based on the amount of financial responsibility required to be maintained shall be applied toward the limitations prescribed in subdivision (a).

(h) The board shall not reimburse a claimant or joint claimant for any eligible costs for which the claimant or joint claimant has been, or will be, compensated by another party.

SEC. 24. Section 25299.99.2 of the Health and Safety Code is amended to read:

25299.99.2. This article, notwithstanding Section 25299.81, shall remain in effect only until January 1, 2010, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2010, deletes or extends that date.

SEC. 25. Section 25299.99.3 is added to the Health and Safety Code, to read:

25299.99.3. In any fiscal year, if the department determines that less than two million dollars ($2,000,000) of unencumbered funds remain in the fund, it shall notify the board and the board shall transfer five million dollars ($5,000,000) from the Underground Storage Tank Cleanup Fund to the Drinking Water Treatment and Research Fund, to be expended for the purposes set forth in Section 116367, if a drinking water well has been contaminated with oxygenate and there is substantial evidence that the contamination was caused by a release from an underground storage tank.

SEC. 26. Section 43013.1 is added to the Health and Safety Code, to read:

43013.1. (a) The State Energy Resources Conservation and Development Commission, in consultation with, and the state board, shall develop a timetable for the removal of MTBE from gasoline at the earliest possible date. In developing the timetable, the commission and the state board shall consider studies conducted by the commission and should ensure adequate supply and availability of gasoline.

(b) The state board shall ensure that regulations for California Phase 3 Reformulated Gasoline (CaRFG3) adopted pursuant to Executive Order D-5-99 meet all of the following conditions:

(1) Maintain or improve upon emissions and air quality benefits achieved by California Phase 2 Reformulated Gasoline in California as of January 1, 1999, including emission reductions for all pollutants, including precursors, identified in the State Implementation Plan for ozone, and emission reductions in potency-weighted air toxics compounds.

(2) Provide additional flexibility to reduce or remove oxygen from motor vehicle fuel in compliance with the regulations adopted pursuant to subdivision (a).

(3) Are subject to a multimedia evaluation pursuant to Section 43830.8.

(c) On or before April 1, 2000, the State Water Resources Control Board, in consultation with the Department of Water Resources and the State Department of Health Services, shall identify areas of the state that are most vulnerable to groundwater contamination by MTBE or other ether-based oxygenates. The State Water Resources Control Board shall direct resources to those areas for protection and cleanup on a prioritized basis. Loans for upgrading, replacing, or removing tanks shall be made available pursuant to Chapter 8.5 (commencing with Section 15399.10) of Part 6.7 of Division 3 of Title 2 of the Government Code. In identifying areas vulnerable to groundwater contamination, the State Water Resources Control Board shall consider criteria including, but not limited to, any one, or any combination of, the following:

(1) Hydrogeology.

(2) Soil composition.

(3) Density of underground storage tanks in relation to drinking water wells.

(4) Degree of dependence on groundwater for drinking water supplies.

SEC. 27. Section 43013.3 is added to the Health and Safety Code, to read:

43013.3. Notwithstanding Section 43013.1, the Secretary for Environmental Protection may prohibit the use of methyl tertiary-butyl ether (MTBE) in motor vehicle fuel prior to December 31, 2002, on a subregional basis in the Bay Area Air Basin, or in any other air basin in the state, if the secretary finds and determines all of the following:

(a) That the removal of MTBE in motor vehicle fuel on a subregional basis will not cause or contribute to the basin being designated as a state or federal nonattainment area for one or more ambient air quality standards, including, but not limited to, state or federal ambient air standards for ambient ozone and carbon monoxide.

(b) That the removal of MTBE in motor vehicle fuel will not increase potency-weighted air toxic compounds, or violate one or more control measures adopted by the state board or a district pursuant to Chapter 3.5 (commencing with Section 39650) of Part 2.

(c) That the subregion is a vulnerable groundwater area as defined in Section 25292.4.

(d) That the removal of MTBE will not significantly affect the price or supply of gasoline in the subregion.

SEC. 28. Section 43830.8 of the Health and Safety Code is repealed.

SEC. 29. Section 43830.8 is added to the Health and Safety Code, to read:

43830.8. (a) The state board may not adopt any regulation that establishes a specification for motor vehicle fuel unless that regulation, and a multimedia evaluation conducted by affected agencies and coordinated by the state board, are reviewed by the California Environmental Policy Council established pursuant to subdivision (b) of Section 71017 of the Public Resources Code.

(b) As used in this section, "multimedia evaluation" means the identification and evaluation of any significant adverse impact on public health or the environment, including air, water, or soil, that may result from the production, use, or disposal of the motor vehicle fuel that may be used to meet the state board's motor vehicle fuel specifications.

(c) The evaluation shall be based on the best available scientific data, written comments submitted by any interested person, and information collected by the state board. At a minimum, the evaluation shall address impacts associated with both of the following:

(1) Emissions of air pollutants, including ozone forming compounds, particulate matter, toxic air contaminants, and greenhouse gases.

(2) Contamination of surface water, groundwater, and soil.

(d) The state board shall prepare a written summary of the multimedia evaluation, and shall submit the summary for external scientific peer review in accordance with Section 57004. The state board shall maintain, for public inspection, a record of any relevant materials from any state agencies and any written public comments on the multimedia evaluation. The state board shall submit the written summary, and the results of the peer review, to the California Environmental Policy Council prior to the adoption of the proposed regulation.

(e) The California Environmental Policy Council shall complete its review of the multimedia review within 90 calendar days following notice from the state board of its intention to adopt a regulation subject to this section. If the council determines that any significant impact on public health or the environment is adverse, or that alternatives exist that would be less adverse, the council shall recommend those alternatives, or other measures that the state board or other state agencies may take, to reduce the adverse public health or environmental impacts. The council shall make all information relating to this review available to the public.

(f) Within 60 days after receiving a notice from the council of a determination of an adverse impact on public health or the environment, the state board shall revise the proposed regulation to avoid or reduce the adverse impacts, or the state agencies subject to this section shall take those appropriate actions that will, to the extent feasible, mitigate the adverse impacts, so that, on balance, there are no adverse impacts on public health or the environment.

(g) In conducting a multimedia evaluation pursuant to subdivision (a), the state board shall consult with other boards and departments within the California Environmental Protection Agency, the State Department of Health Services, the State Energy Resources Conservation and Development Commission, the Department of Forestry and Fire Protection, the Department of Food and Agriculture, and other state agencies with responsibility for, or expertise regarding, impacts that could result from the production, use, or disposal of the motor vehicle fuel that may be used to meet the specification.

(h) Notwithstanding subdivisions (a) to (g), inclusive, the state board may, on or before July 1, 2000, adopt a regulation that was formally proposed prior to January 1, 2000, to revise existing specifications for motor vehicle fuels, if the California Environmental Policy Council has reviewed the environmental assessment of the proposed revision and concurs that there will be no significant adverse impact on public health or the environment, including the impacts on air, water, or soil, that is likely to result from the changes in motor vehicle fuels that are expected to be used to meet the state board's revised motor vehicle fuel specifications. The state board shall deem the determination by the council to be final and conclusive.

(i) The state board shall enter into an agreement, consistent with Section 57004, to conduct an external scientific peer review of the state board's predictive model and, notwithstanding Section 7550.5 of the Government Code, shall submit the findings of that review to the Legislature, on or before July 1, 2000.

SEC. 30. Section 21178 is added to the Public Resources Code, to read:

21178. (a) This section applies only to an application received on or before January 1, 2001, by the permit issuing agency, for a permit to construct a project consisting of facilities, processing units, or equipment necessary to produce Phase 3 reformulated gasoline.

(b) A lead agency shall determine whether an environmental impact report should be prepared within 30 days of its determination that the application for the project is complete.

(c) If a lead agency determines that an environmental impact report should be prepared, the lead agency shall send a notice of preparation, as provided in Section 21080.4, within 10 days of that determination.

(d) If the environmental impact report will be prepared under contract with the lead agency pursuant to Section 21082.1, the lead agency shall issue a request for proposals for preparation of the report as soon as it has adequate information to prepare a request for proposals, and in any event, not later than 30 days after the time for response to the notice of preparation has expired. The contract shall be awarded within 30 days of the response date for the request for proposals.

(e) The period of time for public review and comment on a draft environmental impact report shall be 45 days from the date that a copy of the draft environmental impact report is sent with the public notice by first-class mail, or any other method that is at least as prompt, to any requester. The lead agency may extend the comment period for not more than 15 days if it determines that the public interest will be served. This subdivision shall not be construed to limit the authority of the lead agency to hold a public hearing to receive comments on the draft report after expiration of the 45-day period, or any extended review period. Any comment concerning the adequacy of a negative declaration or environmental impact report that is not received by the lead agency within the 45-day comment period, within any extended review period, or at a public hearing held after the expiration of the 45-day period, shall not be considered part of the record before the lead agency in considering a project approval.

(f) Where a public agency has approved a negative declaration or certified an environmental impact report and approved a project, but has failed to file within five working days after the approval becomes final, the notice required by subdivision (a) of Section 21152, the permit applicant may file a notice of approval, as specified in Section 21152 with the county clerk. The notice shall identify the approving agency and shall contain all of the information required by Section 21152. For purposes of Section 21167, a permit applicant's filing of a notice pursuant to this subdivision shall have the same effect as the public agency's filing of the notice required by Section 21152.

(g) No environmental impact report shall include a discussion of a "no project" alternative, nor shall it include a discussion of any alternative sites for the project that are outside of existing refinery boundaries.

(h) Any action or proceeding brought pursuant to subdivision (c) of Section 21167 shall be commenced within 20 days after the filing of the notice required by subdivision (a) of Section 21152 by the lead agency if the final environmental impact report is sent, by first-class mail at least 15 days before the notice is filed.

(i) For the purposes of this section, "Phase 3 reformulated gasoline" means gasoline meeting the specifications adopted by the State Air Resources Board on or before January 1, 2000, pursuant to Executive Order D-5-99.

(j) The deadlines established in subdivisions (b), (c), and (d) may be extended by a public agency, to the extent that delay is caused by a failure of the applicant to provide necessary information on a timely basis or by the applicant's delay in paying any fees required by the lead agency for preparation of the environmental impact report.

(k) This section shall be repealed on January 1, 2003, unless a later enacted statute, which is enacted on or before January 1, 2003, deletes or extends the date on which it is repealed.

SEC. 31. Section 25310.5 is added to the Public Resources Code, to read:

25310.5. If the commission determines the studies on methyl tertiary-butyl ether (MTBE) undertaken by the commission pursuant to Executive Order D-5-99 and pursuant to the Supplemental Report of the Budget Act of 1997 do not adequately assess the ongoing supply and availability of gasoline for the state's consumers associated with the phaseout of MTBE, notwithstanding Section 7550.5 of the Government Code, the commission shall submit a report to the Legislature and the Governor on or before July 1, 2000, concerning the impact of that phaseout on the supply and availability of gasoline.

SEC. 32. Section 13752 of the Water Code is amended to read:

13752. Reports made in accordance with paragraph (1) of subdivision (b) of Section 13751 shall not be made available for inspection by the public, but shall be made available to governmental agencies for use in making studies, or to any person who obtains a written authorization from the owner of the well. However, a report associated with a well located within two miles of an area affected or potentially affected by a known unauthorized release of a contaminant shall be made available to any person performing an environmental cleanup study associated with the unauthorized release, if the study is conducted under the order of a regulatory agency. A report released to a person conducting an environmental cleanup study shall not be used for any purpose other than for the purpose of conducting the study.

SEC. 33. Nothing in this act shall abrogate, limit, or restrict any right to relief under any theory of liability that any person or any state or local agency may have under any statute or common law for any injury or damage, whether to person or property, including any legal, equitable, or administrative remedy under federal or state law, against any party, with respect to methyl tertiary-butyl ether (MTBE).

SEC. 34. The State Water Resources Control Board shall convene a working group of interested parties, including, but not limited to, local agency, regional board, industry, environmental, and water agency representatives to review and evaluate options for the prompt closure of petroleum underground storage tanks that have not been upgraded to meet the December 22, 1998, upgrade deadline and that have not been closed in conformance with Section 25298 of the Health and Safety Code. On or before January 1, 2001, the working group shall recommend to the Secretary for Environmental Protection appropriate actions to reduce the threat to groundwater resources posed by those tanks.

SEC. 35. (a) It is the intent of the Legislature that California Phase 3 Reformulated Gasoline (CaRFG3) regulations adopted pursuant to Executive Order D-5-99, and proposed by the State Air Resources Board prior to January 1, 2000, be subject to a comprehensive multimedia evaluation consistent with the objectives of this act, to the extent practicable within the timeframe provided in the executive order.

(b) It is further the intent of the Legislature that the evaluation of any significant adverse impact in the conduct of a multimedia evaluation pursuant to Section 43830.8 of the Health and Safety Code be performed by the agency with lead responsibility and expertise over the public health or environmental impact, that the evaluation be subject to peer review, and that the evaluation be submitted to the California Environmental Policy Council for final review and approval.

SEC. 36. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because a local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act, within the meaning of Section 17556 of the Government Code or because costs may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

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Governor Gray Davis
Executive Order

EXECUTIVE DEPARTMENT

STATE OF CALIFORNIA

EXECUTIVE ORDER D-5-99
by the
Governor of the State of California

WHEREAS, the University of California prepared a comprehensive report on the "Health and Environmental Assessment of Methyl Tertiary-Butyl Ether (MTBE)" which has been peer reviewed by the Agency for Toxic Substances and Disease Registry and the United States Geological Survey and other nationally recognized experts;

WHEREAS, the University of California report was widely available for public review and written comment, including hearings in northern and southern California to receive public testimony;

WHEREAS, the findings and recommendations of the U.C. report, public testimony, and regulatory agencies are that, while MTBE has provided California with clean air benefits, because of leaking underground fuel storage tanks MTBE poses an environmental threat to groundwater and drinking water;

NOW, THEREFORE, I, GRAY DAVIS, Governor of the State of California, do hereby find that "on balance, there is significant risk to the environment from using MTBE in gasoline in California" and, by virtue of the power and authority vested in me by the Constitution and statutes of the State of California, do hereby issue this order to become effective immediately:

1. The Secretary for Environmental Protection shall convene a task force consisting of the California Air Resources Board, State Water Resources Control Board, Office of Environmental Health Hazard Assessment, California Energy Commission and the Department of

Health Services for the purpose of implementing this Order.

2. On behalf of the State of California, the California Air Resources Board shall make a formal request to the Administrator of the U.S. Environmental Protection Agency for an immediate waiver for California cleaner burning gasoline from the federal Clean Air Act requirement for oxygen content in reformulated gasoline.

3. The California Environmental Protection Agency shall work with Senator Feinstein and the California Congressional Delegation to gain passage of Senate Bill 645. This legislation would grant authority to the Administrator of the U.S. Environmental Protection Agency to permanently waive the Clean Air Act requirements for oxygen content in reformulated gasoline to states such as California that have alternative gasoline programs that achieve equivalent air quality benefits.

4. The California Energy Commission (CEC), in consultation with the California Air Resources Board, shall develop a timetable by July 1, 1999 for the removal of MTBE from gasoline at the earliest possible date, but not later than December 31, 2002. The timetable will be reflective of the CEC studies and should ensure adequate supply and availability of gasoline for California consumers.

5. The California Air Resources Board shall evaluate the necessity for wintertime oxygenated gasoline in the Lake Tahoe air basin. The Air Resources Board and the California Energy Commission shall work with the petroleum industry to supply MTBE-free California-compliant gasoline year around to Lake Tahoe region at the earliest possible date.

6. By December 1999, the California Air Resources Board shall adopt California Phase 3 Reformulated Gasoline (CaRFG3) regulations that will provide additional flexibility in lowering or removing the oxygen content requirement and maintain current emissions and air quality benefits and allow compliance with the State Implementation Plan (SIP).

7. In order that consumers can make an informed choice on the type of gasoline they purchase, I am directing the California Air Resources Board to develop regulations that would require prominent identification at the pump of gasoline containing MTBE.

8. The State Water Resources Control Board (SWRCB), in consultation with the Department of Water Resources and the Department of Health Services (DHS), shall expeditiously prioritize groundwater recharge areas and aquifers that are most vulnerable to contamination by MTBE and prioritize resources towards protection and

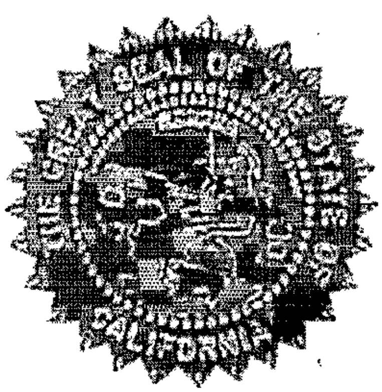
cleanup . The SWRCB, in consultation with DHS, shall develop a clear set of guidelines for the investigation and cleanup of MTBE in groundwater at these sites.

9. The State Water Resources Control Board shall seek legislation to extend the sunset date of the Underground Storage Tank Cleanup Fund to December 31, 2010. The proposed legislation would increase the reimbursable limits for MTBE groundwater cleanups from $1 million to $1.5 million.

10. The California Air Resources Board and the State Water Resources Control Board shall conduct an environmental fate and transport analysis of ethanol in air, surface water, and groundwater. The Office of Environmental Health Hazard Assessment shall prepare an analysis of the health risks of ethanol in gasoline, the products of incomplete combustion of ethanol in gasoline, and any resulting secondary transformation products. These reports are to be peer reviewed and presented to the Environmental Policy Council by December 31, 1999 for its consideration.

11. The California Energy Commission (CEC) shall evaluate by December 31, 1999 and report to the Governor and the Secretary for Environmental Protection the potential for development of a California waste-based or other biomass ethanol industry. CEC shall evaluate what steps, if any, would be appropriate to foster waste-based or other biomass ethanol development in California should ethanol be found to be an acceptable substitute for MTBE.

IN WITNESS WHEREOF I have hereunto
set my hand and caused the Great Seal of the State of California to be affixed this 25th day of March 1999.



Gray Davis

Governor of California

ATTEST: Bill Jones

Secretary of State

Last Updated: May 24, 1999

Secondary Containment Testing

BACKGROUND: A large number of underground storage tank (UST) sites employ double walled tanks and piping as a leak prevention system. Sensors monitor the area between the inner and outer wall (interstitial space) for the presence of stored product that has leaked from the inner tank or piping. This is often done by placing a liquid sensor at a low point in the interstitial space. Product leaking will flow toward the sensor and trigger an alarm. This system relies on the outer wall of the tank or piping to transmit the leaking product toward the sensor. However, the sensor does not monitor the outer wall. Therefore, it is possible to have a break in the outer wall such that product leaking from the tank or piping would be released into the environment. This condition could exist indefinitely, as current regulations do not provide for periodic inspection of secondary containment.

THE SURVEY: SWRCB recently conducted a survey of UST contractors and local regulatory agencies regarding the periodic testing of secondary containment systems. The results are summarized below.

1. The responses from this group of industry experts support the need for testing of secondary containment systems on a regular basis. Secondary containment should be tested upon installation (as is currently required), six months after UST site becomes active, and every 2 years thereafter.
   - Testing at the time of installation will ensure secondary containment is tight upon initial delivery of product.
   - Testing at 6 months will verify factors such as settling in the backfill material, installation errors, and separated connections have not compromised the integrity of the UST. These factors are most likely to occur in the first 6 months of tank operation.
   - Testing every two years thereafter will provide continuing protection against undetected leaks from secondary containment systems. The majority of those surveyed indicated that annual testing would be most effective. However, biannual testing would provide sufficient protection for the environment, while still being cost feasible for tank owners who would have to pay for testing over the life of the UST.

2. A qualified independent contractor should perform testing. Contractor qualifications could include manufacturer, SWRCB, field foreman, or other comparable licensing.

3. There are some circumstances in which testing of secondary containment may not be possible.

4. Testing procedures should be as specified for initial installation testing. This generally involves filling the interstitial spaces with water or pressurized air and determining loss in volume or pressure over a set period of time.

5. Cost of secondary containment testing would vary depending on the particular UST system and inspector. Prices range from $1680 to $4597 for a typical 3-tank service station, averaging approximately $2500. Cost would be higher for UST systems with more dispensers and piping, lower for single-product and low-volume UST systems.

SUMMARY: It is the recommendation of this office that regulations be drafted to require testing of secondary containment upon completion of construction, six months after UST operation begins, and once every two years thereafter. This requirement should be limited to UST systems for which the integrity of the secondary containment is critical to the detection of leaks, and which include no means of continuously monitoring the integrity of the secondary containment. These regulations should also establish a definition for qualified independent contractors who would perform the tests. Additionally, appropriate testing procedures must be specified. The cost associated with implementing these proposed regulations is justified by the additional protection against leaks that secondary containment testing would provide. The addition of these regulations will ensure that secondary containment systems currently required by law will perform as intended.