

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2011-0706  
FOR  
LAMOURE'S INCORPORATED  
1304 G STREET  
FRESNO, FRESNO COUNTY

This Order is issued to Lamoure's Incorporated, a California corporation, (hereafter referred to as "Lamoure's"), pursuant to Water Code section 13304, which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter "Central Valley Water Board") to issue a Cleanup and Abatement Order ("Order"), and Water Code section 13267, which authorizes the Central Valley Water Board to require preparation and submittal of technical and monitoring reports.

The Executive Officer finds, with respect to the Lamoure's acts or failures to act, the following:

**PROPERTY OWNERSHIP AND OPERATIONS**

1. Lamoure's owns property at 1304 G Street, Fresno, APN number 465-040-21 (the "Site"). Attachment A is a map showing the site vicinity. A dry cleaning facility was operated at the Site from approximately 1980 through June 2010. Tetrachloroethene, a volatile organic compound, was used as a dry cleaning solvent at the Site.
2. Lamoure's received an opportunity to review a draft of this Order. The Order may be revised to name other responsible parties in the future should additional responsible parties be identified.

**BACKGROUND**

3. The Site is within the boundaries of the City of Fresno. Groundwater in the vicinity of the site is of good inorganic constituent quality with water from nearby City of Fresno supply well No. 22 having a total dissolved solids concentration of approximately 340 milligrams per liter.
4. Soil and/or groundwater have been impacted by waste originating from the Site. Groundwater in the vicinity of the Site has also been impacted by volatile organic compounds from a site upgradient of Lamoure's (approximately 750 feet south southeast of the Lamoure's Site) and formerly operated by a predecessor of Univar, Inc. ("Univar"). Tetrachloroethene has been detected at concentrations as high as 250 micrograms per liter in groundwater in the immediate vicinity of Lamoure's Site. Univar is voluntarily assessing and remediating the impacts from its former facility. Univar collected soil gas samples within five feet of the Lamoure's building on G Street and adjacent to Univar monitoring well MW 17S. Univar also collected soil gas samples at seven other locations adjacent to monitoring wells both upgradient and downgradient from Lamoure's Site. The maximum tetrachloroethene concentration in soil gas next to the Lamoure's building (sample point SG-4) was 120,000 micrograms per cubic meter

(ug/m<sup>3</sup>) at 30 feet below ground surface (bgs). The highest tetrachloroethene concentration in soil gas samples collected at the other locations was 1,400 ug/m<sup>3</sup> at sampling point SG-7. Tetrachloroethene concentrations in groundwater near sampling points SG-4 and SG-7 are similar, indicating that the high tetrachloroethene soil gas concentration in the sample collected next to Lamoure's was not created by the impacted groundwater. Lamoure's is the only known user of tetrachloroethene immediately adjacent to sampling point SG-4. The State of California Office of Environmental Health Hazard Assessment has set a California Human Health Screening Level of 603 micrograms per cubic meter for tetrachloroethene in soil gas at commercial sites. The above data indicates that use of tetrachloroethene at the subject Site has impacted soil and/or groundwater at the Site.

5. On 1 March 2010, Central Valley Water Board staff sent a letter to Lamoure's summarizing assessment data collected adjacent to the site and requesting submittal of a work plan proposing assessment at the site. The work plan was due 23 April 2010. No response was received. An Order issued pursuant to Water Code section 13267 was issued by the Executive Officer to Lamoure's on 6 May 2010. A signed certified U.S. mail receipt was received indicating that Lamoure's had received the Order. No response was received by the due date of 7 June 2010. Central Valley Water Board staff sent Lamoure's a Notice of Violation dated 21 July 2010 for non-response to the section 13267 order. A work plan dated 9 August 2010 was received from RCC Group LLC on behalf of Lamoure's. The work plan was incomplete and did not contain some information or propose some tasks for completing investigations specifically required by the 13267 order.

#### LEGAL AUTHORITY

6. Soil gas concentrations of tetrachloroethene at the Site indicate that Lamoure's operations have impacted soil at the Site. Tetrachloroethene discharged to and deposited within soil at the Site will likely migrate or continue to migrate to groundwater. Tetrachloroethene dissolved in groundwater will continue to disperse and migrate to unaffected and less affected waters. Tetrachloroethene will likely, or will continue to, alter the quality of groundwater to a degree that unreasonably affects the waters for designated beneficial uses, continuing and expanding a condition of pollution, unless cleaned up.
7. Water Code section 13304(a) states, in relevant part:

Any person ... who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including but not limited to, overseeing cleanup and abatement efforts. Upon failure of any person to comply with the cleanup or abatement order, the Attorney General, at the request of the regional board, shall petition the superior court for that county for the issuance of an injunction requiring the person to comply with the order...

8. Water Code section 13267(b)(1) states, in relevant part:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

9. Water Code section 13304(c)(1) states, in relevant part:

... the person or persons who discharged the waste, discharges the waste, or threatened to cause or permit the discharge of the waste within the meaning of subdivision (a), are liable to that government agency to the extent of the reasonable costs actually incurred in cleaning up the waste, abating the effects of the waste, supervising cleanup or abatement activities, or taking other remedial actions. . .

10. The *Water Quality Control Plan for the Tulare Lake Basin*, Second Edition, revised January 2004 (the "Basin Plan"), designates beneficial uses of the waters of the State and establishes water quality objectives ("WQOs") to protect those areas. The Site overlies groundwater within the Kings Basin Hydrologic Unit, Detailed Analysis Unit 233. Present and potential future beneficial uses of this groundwater include municipal and domestic supply ("MUN"), agricultural supply, industrial supply, industrial process supply, water contact recreation, and non-contact water recreation.

11. The Basin Plan contains a narrative WQO for chemical constituents which requires, in part, that groundwater not contain chemical constituents in concentrations that adversely affect any beneficial use. For groundwaters that are designated MUN, the Basin Plan incorporates by reference drinking water maximum contaminant levels ("MCLs") promulgated in the California Code of Regulations, title 22, chapter 15 ("Title 22"). The following constituents have numeric MCLs associated with them, and these numeric MCLs implement the narrative WQO for chemical constituents:

Constituent	Limits*	WQO	Reference
Tetrachloroethene	5	Chemical	Primary MCL, Title 22

\* In micrograms per liter (ug/L)

The concentrations of the waste constituents listed above that are currently found in groundwater (Finding No. 4), or are likely to be found in groundwater after migration from soils, significantly exceed the applicable WQOs.

12. The Basin Plan also contains narrative WQOs that apply to groundwater for tastes and odors and for toxicity. The taste and odor WQO requires, in part, that groundwater not contain substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes and odors to municipal and domestic water supplies. The toxicity WQO requires, in part, that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans.
13. Pollution, as it is defined in Water Code section 13050(l)(1), means the alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either the waters for beneficial uses, or the facilities which serve these beneficial uses. The WQOs delineated in Findings 11 and 12 are designed to protect the beneficial uses of the groundwater underlying the Site. As the wastes discharged from the Site have caused or have the potential to cause groundwater to exceed the applicable WQOs, a condition of pollution is present or will likely be present in groundwater.
14. The State Water Resources Control Board ("State Water Board") has adopted Resolution 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304* ("Resolution 92-49"). Resolution 92-49 sets forth the policies and procedures to be used during an investigation and cleanup of a polluted site, and requires that cleanup levels be consistent with State Water Board Resolution 68-16, the *Statement of Policy With Respect to Maintaining High Quality of Waters in California*. ("Resolution 68-16") Resolution 92-49 and the Basin Plan establish the cleanup levels to be achieved. Resolution 92-49 requires the waste to be cleaned up in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored. Any alternative cleanup level to background must: (1) be consistent with the maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Basin Plan and applicable Water Quality Control Plans and Policies of the State Water Board. Resolution 92-49 directs that investigation proceed in a progressive sequence. To the extent practical, it directs the Central Valley Water Board to require and review for adequacy written work plans for each element and phase, and the written reports that describe the results of each phase of the investigation and cleanup.
15. Chapter IV of the Basin Plan also contains a policy for the *Investigation and Cleanup of Contaminated Sites*. The strategy generally outlines a process that includes site investigation, source removal or containment, information requirements for the consideration of establishing cleanup levels, and a basis for establishing soil and groundwater cleanup levels.
16. California Code of Regulations, title 23, sections 3890 through 3895, require that the Dischargers submit analytical data electronically via the internet using electronically deliverable formats (EDF) designated by the State Water Board that are both non-proprietary and available as public domain. All EDF data must be submitted over the Internet to the State Water Board Geographic Environmental Information Management System database (Geotracker). In addition, section 3895(b) allows the Central Valley

Water Board to specify submittal in alternative forms provided the benefit or need for it bears a reasonable relationship to the burden of producing it.

### DISCHARGER LIABILITY

17. As described in the above Findings, Lamoure's is subject to an order pursuant to Water Code section 13304 because Lamoure's has discharged or deposited waste and caused or permitted waste to be discharged or deposited where it has discharged, or likely discharged to waters of the state and has created, or likely will create, a condition of pollution. The meaning of the term "discharge", as interpreted by the State Water Board in precedential orders, including State Water Board Order WQ 86-2 (*In the Matter of the Petition of Zoecon Corporation*), includes the passive migration of waste from soils to groundwater. The discharge, as stated in Finding 13, has resulted, or will likely result, in a condition of pollution. The condition of pollution is a priority violation and issuance or adoption of a cleanup or abatement order pursuant to Water Code section 13304 is appropriate and consistent with policies of the Central Valley Water Board.
18. This Order requires investigation and cleanup of the Site in compliance with the Water Code, the applicable Basin Plan, Resolution 92-49, Title 27, and other applicable plans, policies, and regulations.
19. As described in the above Findings, Lamoure's is subject to an order pursuant to Water Code section 13267 to submit technical reports because existing data and information about the Site indicate that waste has been discharged, is discharging, or is suspected of discharging, at the property, which is or was owned and/or operated by Lamoure's. The technical reports required by this Order are necessary to assure compliance with section 13304 of the Water Code, including prompt identification and abatement of the source and investigation and cleanup of the affected area to protect the beneficial uses of waters of the state, to protect against nuisance, and to protect human health and the environment. The burden of providing these reports consists of preparation of work plans, assessment of soil, soil gas, and groundwater, and preparation of reports, and is considered reasonable, because these investigations will help to protect the public from hazardous materials.
20. Should Lamoure's fail to take any of the cleanup actions specified in this Order, the Central Valley Water Board may impose administrative civil liability pursuant to Water Code section 13350, which states, in relevant part:
  - (a) Any person who (1) violates any cease and desist order or cleanup and abatement order hereafter issued, reissued, or amended by a regional board ... shall be liable civilly, and remedies may be proposed, in accordance with subdivision (d) or (e)...
  - (e) The state board or a regional board may impose civil liability administratively pursuant to Article 2.5 (commencing with Section 13323) of Chapter 5 either on a daily basis or on a per gallon basis, but not both.
    - (1) The civil liability on a daily basis may not exceed five thousand dollars (\$5,000) for each day the violation occurs.

(A) When there is a discharge, and a cleanup and abatement order is issued, except as provided in subdivision (f), the civil liability shall not be less than five hundred dollars (\$500) for each day in which the discharge occurs and for each day the cleanup and abatement order is violated.

(B) When there is no discharge, but an order issued by the regional board is violated, except as provided in subdivision (f), the civil liability shall not be less than one hundred dollars (\$100) for each day in which the violation occurs.

(2) The civil liability on a per gallon basis may not exceed ten dollars (\$10) for each gallon of waste discharged.

21. Should Lamoure's fail to submit any of the technical or monitoring reports required by this Order, the Central Valley Water Board may impose administrative civil liability pursuant to Water Code section 13268, which states, in relevant part:

(a)(1) Any person failing or refusing to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267 . . . or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in accordance with subdivision (b).

(b)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (a) in an amount which shall not exceed one thousand dollars (\$1,000) for each day in which the violation occurs.

(c) Any person discharging hazardous waste, as defined in Section 25117 of the Health and Safety Code, who knowingly fails or refuses to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267, or who knowingly falsifies any information provided in those technical or monitoring program reports, is guilty of a misdemeanor, may be civilly liable in accordance with subdivision (d), and is subject to criminal penalties pursuant to subdivision (e).

(d)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (c) in an amount which shall not exceed five thousand dollars (\$5,000) for each day in which the violation occurs.

#### CEQA

22. The issuance of this Order is an enforcement action taken by a regulatory agency and is exempt from the provisions of the California Environmental Quality Act (Public Resources Code section 21000 et seq.), pursuant to California Code of Regulations (CCR), Title 14, section 15321(a)(2). The issuance of this Order may also be considered an action by a regulatory agency for the protection of the environment, exempt pursuant to CCR, Title 14, section 15308. The implementation of this Order may be considered a minor action to prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of hazardous waste or hazardous substances, exempt pursuant to CCR, Title 14, section 15330.

## REQUIRED ACTIONS

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13304 and 13267, Lamoure's shall:

1. Forthwith, investigate the discharge of waste, cleanup the waste, and abate the effects of the discharge of waste, including volatile organic compounds and hazardous waste, to soil and groundwater, in conformance with Resolution 92-49 and with the Basin Plan (in particular the Policies and Plans listed within the Control Action Considerations portion of Chapter IV). "Forthwith" means as soon as is reasonably possible without risk to health and safety. Staff, when referenced below, means Central Valley Water Board technical staff. Compliance with this requirement shall include, but not be limited to, completing the tasks listed below.
2. **By 19 December 2011**, submit a technical report that contains a written work plan prepared by a qualified professional, proposing a systematic and logical sequence of tasks with a proposed schedule to investigate releases of volatile organic compounds to soil and/or groundwater from the subject property and nearby sewer lines, and/or septic systems. The work plan shall include a history of volatile organic compound usage, storage, handling, and disposal practices, a map of the facility showing the former location of dry cleaning equipment, and the locations of sewer lines and any existing or former septic system. The work plan shall propose tasks including collection of active soil gas samples to delineate the lateral and vertical extent of soil impacted by volatile organic compounds and other wastes discharged. Tasks shall also be proposed to delineate whether groundwater has been impacted by releases that have occurred at the site and the lateral and vertical extent of impacts to groundwater. The work plan shall contain the information in Attachment B, which is made part of this Order.
3. Within **30 days** of approval of the work plan required by Required Action 2 above, implement the tasks proposed in accordance with a time schedule as approved or directed by the Executive Officer, which shall become part of this Order.
4. Submit a Site Assessment Report for soil and groundwater in accordance with the approved time schedule. The Site Assessment Report shall contain the information in Attachment C, which is made part of this Order, and include recommendations and a work plan for additional investigation, if needed.
5. Within **30 days** of staff concurrence with the work plan for additional site assessment, if any, implement the work plan for additional investigation and submit a Final Site Assessment Report, which contains the information in Attachment B, in accordance with the approved time schedule, which shall become part of this Order.
6. Within **120 days** of staff concurrence that the site has been assessed sufficiently to evaluate remedial options, submit a Feasibility Study/Remedial Options Evaluation Report for soil and/or groundwater remediation. The report shall contain the information in Attachment D, which is made part of this Order. The proposed alternative for soil and/or groundwater must meet the range of cleanup levels as

described in the Basin Plan and State Water Resources Control Board Resolution 92-49. The Discharger shall attempt to clean up each constituent to background concentrations, or to the lowest level that is technically and economically achievable and which complies with all applicable water quality objectives of the Basin Plan.

7. Within **60 days** of staff concurrence with the Feasibility Study/Remedial Options Evaluation Report for soil and groundwater cleanup, submit a Cleanup Plan, which describes the preferred alternative(s) and includes a time schedule to conduct the cleanup activities. The Cleanup Plan shall contain the information in Attachment E, which is made part of this Order. The approved time schedule shall become part of this Order.
8. Within **60 days** of approval by the Executive Officer of the Cleanup Plan, commence cleanup or installation of the approved remedial options. The Discharger shall notify staff a minimum of 72 hours prior to beginning field work.
9. Within **120 days** of Executive Officer approval of the cleanup plan, submit a report describing the status and results of the cleanup work. The report shall clearly show whether the installation of any cleanup system is complete, and if not, give a schedule for installation of the remaining remedial systems.

### GENERAL REQUIREMENTS

Lamoure's shall:

10. As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, have reports prepared by, or under the supervision of, a registered professional engineer or geologist and signed by the registered professional. All technical reports submitted by Lamoure's shall include a cover letter signed by an authorized representative of Lamoure's, certifying under penalty of law that the signer has examined and is familiar with the report and that to their knowledge, the report is true, complete, and accurate. Lamoure's shall also state if it agrees with any recommendations/proposals and whether it approved implementation of said proposals.
11. Conduct work only after Central Valley Water Board staff concurs with the proposed work.
12. Notify Central Valley Water Board staff at least three working days prior to any onsite work, testing, or sampling that pertains to environmental remediation and investigation and is not routine monitoring, maintenance, or inspection.
13. Obtain all local and state permits and access agreements necessary to fulfill the requirements of this Order prior to beginning the work.
14. Continue any remediation or monitoring activities until such time as the Executive Officer determines that sufficient assessment and/or remediation has been

accomplished to fully comply with this Order and this Order has been either amended or rescinded in writing.

15. If, for any reason, Lamoure's is unable to perform any activity or submit any document in compliance with the schedule set forth herein, or in compliance with any work schedule submitted pursuant to this Order and approved by the Executive Officer, Lamoure's may request, in writing, an extension of the time specified. The extension request shall include justification for the delay. Any extension request shall be submitted as soon as the situation is recognized and no later than the compliance date. An extension may be granted by revision of this Order or by a letter from the Executive Officer. Extension requests not approved in writing by the Executive Officer with reference to this Order are denied.
16. Reimburse the Central Valley Water Board for reasonable costs associated with oversight of the investigation and remediation of the Site, as provided in Water Code section 13304(c) (1). **By 3 November 2011**, provide the name and address where the invoices shall be sent. Failure to provide a name and address for invoices and/or failure to reimburse the Central Valley Water Board's reasonable oversight costs shall be considered a violation of this Order.

If, in the opinion of the Executive Officer, Lamoure's fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement or may issue a complaint for administrative civil liability. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

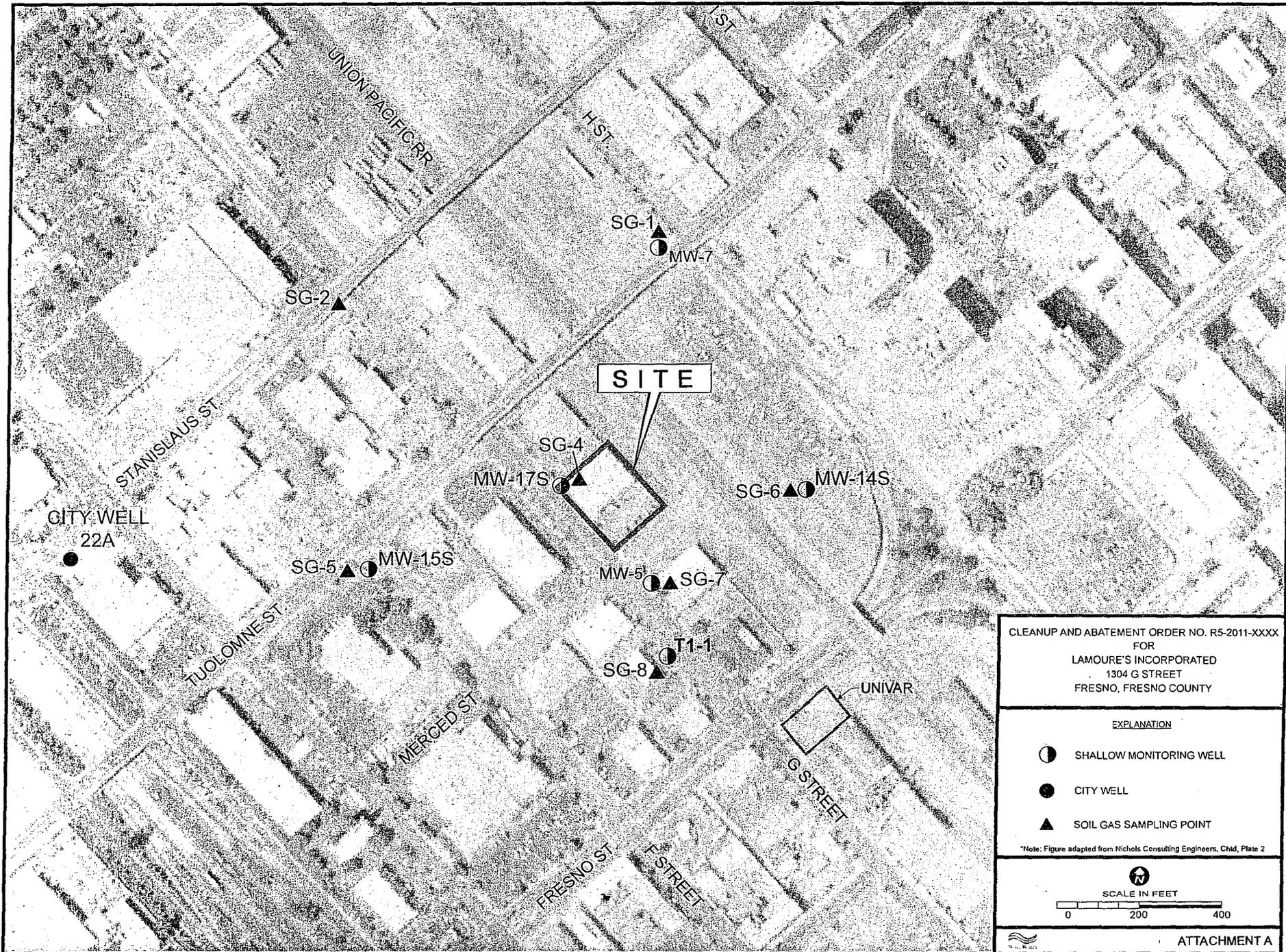
Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and CCR, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

[http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality)

or will be provided upon request.

This Order is effective upon the date of signature.

*Clay L. Rodgers*  
for PAMELA C. CREEDON, Executive Officer  
10/7/2011  
(Date)



**ATTACHMENT B**  
**ITEMS TO BE INCLUDED IN A SITE ASSESSMENT WORK PLAN**

The outline below is a minimum requirement for items to be included and discussed in the text of all site assessment work plans submitted to the Board. All work plans must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

**I. BACKGROUND**

*A. Site History*

State all operations conducted at the site.

Identify present and historic chemical usage and handling procedures.

List all chemical spills and their disposition.

Identify all past and present above ground and under ground tank locations.

Identify tank capacities and other specifications as necessary.

Identify tank contents, past and present.

Submit all records of tests or repairs on fuel lines and tanks.

Identify locations of maintenance shops, chemicals used in the shops, method of chemical storage and disposal.

Identify past and present land uses and future as applicable.

*B. Topographic map of site vicinity showing:*

All natural and man-made drainage features including ditches and surface impoundments, and the drainages destination;

Utilities, especially storm drain system;

Location of existing monitoring wells, including those installed by other parties;

Location of above ground and underground storage tanks, other waste-handling facilities, and/or spill site;

Location of a major body of water relative to the site;

Location of any nearby private, municipal, or irrigation wells; and

Other major physical and man-made features.

*C. Geology/Hydrogeology*

Include proposal for logging of boreholes and characterizing site geology, and identifying unconfined or confined aquifers and contaminant flowpaths.

**II. PREVIOUS SITE ASSESSMENTS**

Provide a detailed description of any previous site assessment conducted to determine if there is any soil or ground water contamination. Include analytical results of all soil and water samples analyzed, and water level and floating product measurements.

### III. FIELD INVESTIGATION

#### A. *General*

Monitoring well locations and rationale  
Survey details  
Equipment decontamination procedures  
Health and safety plan

#### B. *Drilling Details*

Describe drilling and logging methods

#### C. *Monitoring Well Design*

Casing diameter  
Borehole diameter  
Depth of surface seal  
Well construction materials  
Diagram of well construction  
Type of well cap  
Size of perforations and rationale  
Grain size of sand pack and rationale  
Thickness and position of bentonite seal and sand pack  
Depth of well, length and position of perforated interval

#### D. *Well Development*

Method of development to be used  
Method of determining when development is complete  
Method of development water disposal

#### E. *Soil Sampling*

Cuttings disposal method  
Analyses to be run and methods  
Sample collection and preservation method  
Intervals at which soil samples are to be collected  
Number of soil samples to be analyzed and rationale  
Location of soil samples and rationale  
QA/QC procedures

#### F. *Well Sampling*

Minimum time after development before sampling (48 hours)  
Well purging method and amount of purge water  
Sample collection and preservation method  
QA/QC procedures

#### G. *Water Level Measurement*

Elevation reference point at each monitoring well shall be within 0.01 foot.  
Ground surface elevation at each monitoring well shall be within 0.1 foot.  
Method and time of water level measurement shall be specified.

**IV. QA/QC PROCEDURES**

Specify number of field blanks and duplicates.

**V. TIME SCHEDULE FOR PROPOSED WORK**

The work plan shall include a time schedule for implementation of work.

**ATTACHMENT C**  
**ITEMS TO BE INCLUDED IN A SITE ASSESSMENT REPORT**

The outline below is a minimum requirement for items to be included and discussed in the text of all site assessment reports submitted to the Board. Other supporting data to be included in the report, either within the text of the report or in appendices, are italicized at the end of each section. All reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

**I. INTRODUCTION**

- Summary of past investigations
- Purpose of the recent investigation
- Scope of the recent investigation
- Time period in which the recent investigation was carried out

**II. SUMMARY**

- Number of wells drilled
- Results of soil and water analyses
- Groundwater flow direction and gradient
- Possible source determination

**III. FIELD INVESTIGATION**

Well Construction

- Number and depth of wells drilled
- Date(s) wells drilled
- Description of drilling and construction
- Approximate locations relative to facility site(s)

Supporting Data

A well construction diagram for each well should be included in the report which shows the following details:

- Total depth drilled
- Depth of open hole (same as total depth drilled if no caving occurs)
- Footage of hole collapsed
- Length of slotted casing installed
- Depth of bottom of casing
- Depth to top of sand pack
- Thickness of sand pack
- Depth to top of bentonite seal
- Thickness of bentonite seal
- Thickness of concrete grout
- Boring diameter
- Casing diameter
- Casing material

- Size of perforations
- Number of bags of sand
- Well elevation at top of casing
- Depth to groundwater
- Date of water level measurement
- Monitoring well number
- Date drilled
- Location

**Well Development**

- Date(s) of development of each well
- Method of development
- Volume of water purged from well
- How well development completion was determined
- Method of effluent disposal

**Supporting Data**

Field notes from well development should be included in report.

**Water Sampling**

- Date(s) of sampling
- How well was purged
- How many well volumes purged
- Levels of temperature, EC, and pH at stabilization
- Sample collection, handling, and preservation methods
- Sample identification
- Analytical methods used

**Soil Sampling**

- Date(s) of sampling
- Sample collection, handling, and preservation method
- Sample identification
- Analytical methods used

**IV. FINDINGS OF THE INVESTIGATION**

**Lithology**

- Types of sediments encountered
- Presence, location, and lateral continuity of any significant sand, silt, or clay layers
- Any visual signs of contamination

**Supporting Data**

Well logs geologic cross-sections should be included in the report.

**Analytical Results of Soil and Groundwater Sampling**

Analytical results of each monitoring well should be summarized

Supporting Data  
Laboratory analytical sheets  
Chain-of-custody forms

Water Levels

Static water levels measured when well drilled  
Date(s) of water level measurements  
Water levels determined prior to sampling

Supporting Data

Dates of water level measurement, depths to groundwater, and groundwater elevations should be tabulated and included in the report.

Groundwater Gradient and Flow Direction

Groundwater gradient and flow direction determined by the investigation should be discussed and compared to the regional gradient and flow direction.

Supporting Data

A groundwater contour map, drawn to scale, should be provided which shows each well, its groundwater elevation, and lines of equal groundwater elevation. Groundwater gradient and flow direction should be shown on the map. The calculation of the gradient should be included.

**V. RESULTS OF QA/QC**

QA/QC procedures  
QC sample identification  
Field blank analyses  
Comparison of duplicate sample results

**VI. CONCLUSIONS AND RECOMMENDATIONS**

Evaluate any contamination found;  
Compare to background levels and appropriate screening levels;  
Identify any suspected source of contamination;  
Recommend any further investigative needs based on data gaps; interim remedial measures; public participation;

**ATTACHMENT D**  
**ITEMS TO BE INCLUDED IN A**  
**FEASIBILITY STUDY/REMEDIAL OPTIONS EVALUATION REPORT**

The outline below is a minimum requirement for items to be included and discussed in the text of all feasibility studies/remedial option evaluation reports submitted to the Board. Reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the state of California.

**I. Purpose of Feasibility Study/Remedial Options Evaluation**

**II. Background**

- A. Description of Facility
- B. Site History
  - 1. Years of Operation
  - 2. Chemical Use
  - 3. Chemical Releases (Potential and Documented)
- C. Geology
  - 1. Regional
  - 2. Local, soil type, lithology, lateral extent of lithologic units
- D. Hydrogeology
  - 1. Aquifers, aquitards, perched aquifers
  - 2. Groundwater flow rates, directions, recharge, discharge
  - 3. Groundwater use
  - 4. Extraction and injection wells affect on groundwater flow
- E. Surface Water
  - 1. Losing or gaining streams, ponds, etc.
  - 2. Hydraulic connection with aquifers
- F. Local Land Use
- G. Previous Investigation and Remedial Actions

**III. Nature and Extent of Contamination**

- A. Contaminants in Soils
  - 1. Types and Concentrations
  - 2. Lateral and Vertical Extent
- B. Pollutants in Groundwater
  - 1. Types and Concentrations
  - 2. Lateral and Vertical Extent (including Perched Zones)

**IV. Contaminant Fate and Transport**

- A. Contaminant Properties
  - 1. Mobility
  - 2. Toxicity
  - 3. Half-life
  - 4. Chemical and biological degradation

B. Contaminant Transport based on Soil and Aquifer Properties

**V. Remedial Action Objectives**

**VI. Description of Remedial Action Alternatives** – at a minimum, 3 alternatives must be considered

- A. Alternative that meets background levels
- B. Alternative that meets water quality objectives
- C. Alternative that meets levels between background and water quality objectives

**VII. Evaluation of Remedial Action Alternatives**

- A. Overall protectiveness of human health and the environment
- B. Compliance with laws and regulations
- C. Long term effectiveness and performance
- D. Reduction of toxicity, mobility, and volume
- E. Short term effectiveness
- F. Implementability
- G. Cost
- F. State and community acceptance

**VIII. Potential Impacts of Remedial Actions**

**IX. Estimated Project Schedule for Each Alternative**

**X. Preferred Alternative**

## **ATTACHMENT E ITEMS TO BE INCLUDED IN A CLEANUP PLAN**

The outline below is a minimum requirement for items to be included and discussed in the text of all cleanup plans submitted to the Board. All reports must be signed and stamped by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

### **I. INTRODUCTION**

#### **A. Site assessment and characteristics**

Site background

Site description and location

Site history

Historic and current operations conducted at the site correlated to site contamination

Existing and planned use of the site

Present and historic chemical usage and handling procedures

Site geology and hydrogeology

Condition of surface and/or subsurface soil

All previous investigations with reference to relevant documents

#### **B. Nature and Extent of Soil and Groundwater Contamination**

1. Constituents and concentrations, including background concentrations

2. Lateral and vertical extent

3. Site maps to show above, including locations of any groundwater monitoring wells relative to soil and groundwater contamination

### **II. SUMMARY OF SELECTED REMEDIATION ALTERNATIVE**

Discussion of selected remedial alternative

Discussion of implementation of remedial alternative

Summary of field activities

Summary of bench-scale testing

Summary of aquifer testing

Remedial investigation results

Summary of remedial goals

Compliance with Federal and State regulations, if applicable

### **III. TREATMENT SYSTEM DESIGN AND IMPLEMENTATION**

Conceptual model/remedial design

Overview

Equipment selection and operation

System schematics (layout, instrumentation, and controls)

Treatment processes

Construction activities and utility requirements

- Operation, maintenance and performance monitoring
- Start-up sampling and performance monitoring
- Sampling and analysis plan to demonstrate system effectiveness, performance optimization, and long term operation with respect to achieving cleanup goals
- Potential for off-site migration
- Emission and discharge controls
- Handling and disposal procedures
- Quality assurance/quality control plan

#### **IV. CLOSURE AND POST-CLOSURE MONITORING**

- Cleanup strategy
- Field sampling plan for closure and post-closure monitoring
- Long term operation and maintenance of remedial action measures, if any are needed

#### **V. TIME SCHEDULE FOR IMPLEMENTATION AND REPORTING**