CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2014-0702
FOR
HARVEY HANOIAN
JOHN HANOIAN
4260 E. BUTLER AVENUE
FRESNO, FRESNO COUNTY

This Order is issued to Harvey Hanoian and John Hanoian, (hereafter referred to as Dischargers) pursuant to Water Code section 13304, which authorizes the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board or 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 of the Central Valley Water Board finds, with respect to the Dischargers' acts or failures to act, the following:

PROPERTY OWNERSHIP AND OPERATIONS

1. The Dischargers own property at 4260 E. Butler Avenue, Fresno, APN number 471-070-20 (Site). Attachment A is a map showing the site vicinity. A dry cleaning facility operated at the Site from approximately 1963 through the mid-1980's. The Site currently operates as a Laundromat.

2. The Dischargers received an opportunity to review a draft of this Order. The Order may be revised to name other responsible parties in the future should the Board identify additional responsible parties.

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 wells having total dissolved solids concentrations of approximately 260 to 360 milligrams per liter.

4. Soil gas, soil, and/or groundwater have been impacted by waste that was discharged at the Site. Tetrachloroethene has been detected in soil gas at concentrations up to 2,800,000 micrograms per cubic meter. Tetrachloroethene has been detected in groundwater 350 feet downgradient of the Site at concentrations up to 55 micrograms per liter.

5. Soil gas samples were collected at a depth of five feet at seven locations in the vicinity of the Site. Soil gas samples collected on 12 June 2013 adjacent to the building housing the former dry cleaner had tetrachloroethene concentrations ranging from 540,000 micrograms per cubic meter to 2,800,000 micrograms per cubic meter. A soil gas sample collected on the same day 120 feet west of the Site had a tetrachloroethene concentration of 140,000 micrograms per cubic meter.

6. An air sample was collected in the building at 4260 E. Butler on 17 January 2014. The sample was collected over a period of eight hours when the building was closed. The sample had a tetrachloroethene concentration of 120.9 micrograms per cubic meter. This is above the California Human Health Screening Level for tetrachloroethene in indoor air of 0.69 micrograms per cubic meter.

7. A Central Valley Water Board letter dated 1 August 2013 requested that the Dischargers submit a work plan proposing tasks to investigate the presence of volatile organic compounds in soil, soil gas, and groundwater. Though the Dischargers submitted a work plan on 1 October 2013, the Board notified the Dischargers by letter dated 4 November 2013 that the proposed work plan failed to meet the requirements of the Central Valley Water Board. The Board requested that the Dischargers submit a revised work plan by 27 November 2013.

8. The Dischargers submitted a revised work plan by the 27 November 2013 deadline, but the revised work plan also failed to meet applicable requirements. A Board letter, dated 20 December 2013, requested that the Dischargers again attempt to submit a work plan that would effectively investigate the presence of volatile organic compounds in soil, soil gas, and groundwater. The Board requested that the Dischargers submit the revised work plan by 10 January 2014.

9. The document which the Dischargers submitted on 31 January 2014 and which included the results of indoor air sampling, again failed to meet Central Valley Water Board applicable requirements. A letter dated 20 March 2014 stated that the 31 January 2014 work plan had not proposed specific boring locations and assessment tasks to meet the requirements of the Central Valley Water Board. The 20 March 2014 letter gave specific items to be included in a work plan and required that a new work plan be submitted by 1 April 2014.

10. The 31 January 2014 document included the results of air samples collected inside the building at 4260 E. Butler and several nearby buildings. The tetrachloroethene concentration inside 4260 E. Butler was 120.9 micrograms per cubic meter, significantly greater that the California Human Health Screening Level (CHHSL) for indoor air of 0.69 micrograms per cubic meter. A Central Valley Water Board letter dated 7 February 2014 required the submittal of a report proposing remedial options for indoor air for all of the buildings with elevated concentrations of tetrachloroethene in air by 28 February 2014. An extension request submitted on 28 February 2014 by the Dischargers for the due date of the remedial options report was denied in a Central Valley Water Board letter dated 7 March 2014. The extension request was denied due to the human health concerns posed by the tetrachloroethene concentrations in indoor air.

11. The Dischargers submitted a report prepared by John Minney and dated 28 March 2014. It contained a general design for a soil vapor extraction system to treat shallow soil (depth to five feet). It included no site specific soil data for design of the system. Mr. Minney stated that he did not recommend that the system be installed. He stated that "the slight increase in the dry cleaning components do not indicate that a remediation is warranted on the indoor air quality..." The indoor quality exceeds the tetrachloroethene indoor air CHHSL by more than 170 times and remediation of indoor air is required to protect the human health of those occupying the affected buildings.

12. The 28 March 2014 submittal also contained comments regarding an unused well at the site and the assessment required for the site. The Board's 7 March 2014 letter required that the Dischargers submit a work plan proposing tasks for sampling the unused well by 7 April 2014. The 28 March 2014 submittal states that various well drilling contractors "have been instructed to base their proposed work upon first cleaning out the interior of the well and the (sic) pulling a sample to be tested for VOAs." The submittal does not propose specific tasks for collecting of a water sample as required by the 7 March 2014 Central Valley Water Board letter. In a subsequent submittal dated 9 May 2014, the Discharger has agreed to collecting grab samples from the well prior to cleaning out of the well. Separately, recommendation no. 1 of the report deals with the requirement that a work plan for assessment of soil, soil gas, and groundwater for

the site needs to be submitted. Mr. Minney states that he "would still recommend just one cone penetrometer at the URS soil-vapor hot spot, subject to change if the newly found old well test does not come back reasonably clean. The Central Valley Water Board has issued numerous letters, as documented above, requesting a work plan including acceptable tasks for assessing soil, soil gas, and groundwater for the presence of tetrachloroethene and other volatile organic constituents. The 28 March 2014 submittal does not present assessment tasks acceptable to the Central Valley Water Board.

13. The Dischargers submitted a work plan prepared by John Minney and dated 9 May 2014. The work plan proposed sampling an existing unused water well and drilling one onsite boring for installation of soil vapor probes. The work plan did not propose acceptable tasks sufficient for assessing the lateral and vertical extent of degradation by volatile organic constituents at the site. A Central Valley Water Board letter dated 22 May 2014 comments on the work plan and requests the submittal of an amended work plan.

14. The Dischargers submitted a document prepared by John Minney and dated 9 May 2014 that addresses indoor air quality at the site. The document proposes installation of ventilation systems in all occupied buildings. The ventilation systems are sized so that indoor air will have air quality similar to that of outside air in the vicinity of the site. Installation of the proposed ventilation was approved in a letter dated 22 May 2014. A report on installation of the system and initial sampling of indoor air quality is due by 8 August 2014.

LEGAL AUTHORITY

15. The *Water Quality Control Plan for the Tulare Lake Basin*, Second Edition, revised January 2004 (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 No. 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.

16. The concentrations of tetrachloroethene in soil gas at the Site indicate that operations of the former dry cleaning facility 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.

17. 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...

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

> In conducting an investigation ... 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 ... 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.

19. 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. . .

20. 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. 5), or are likely to be found in groundwater after migration from soils, significantly exceed the applicable WQOs.

21. 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.

22. 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 Nos. 18 and 19 are designed to protect the beneficial uses of the groundwater underlying the Site. As the wastes discharged from the Site have the potential to cause or have caused groundwater to exceed the applicable WQOs, a condition of pollution will likely be present or is present in groundwater.

23. The State Water Resources Control Board (State Water Board) has adopted Resolution No. 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 No. 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.

24. 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.

25. 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

26. As described in the above Findings, the Dischargers are subject to an order pursuant to Water Code section 13304 because the Dischargers have discharged or deposited waste and/or 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 No. 20, has resulted, or will likely result, in a condition of pollution. The condition of pollution is a priority violation and the issuance of a cleanup or abatement order pursuant to Water Code section 13304 is appropriate and consistent with policies of the Central Valley Water Board.

27. 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.

28. As described in the above Findings, the Dischargers are 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 the Dischargers. The technical reports required by this Order are necessary to ensure compliance with this Order, 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.

CEQA

29. 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 (Pub. Resources Code, §21000 et seq.) in accordance with California Code of Regulations, title 14, section15321(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 California Code of Regulations, 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 California Code of Regulations, title 14, section 15330.

REQUIRED ACTIONS

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13304 and 13267, the Dischargers 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 No. 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 8 August 2014,** submit a report documenting the installation of ventilation systems in each of the buildings capable of introducing sufficient outdoor so that indoor air quality is equivalent or better than outdoor air quality in the vicinity of the site. The report shall also include results of initial air samples collected in the buildings to verify the efficiency of the system(s) in improving indoor air quality.

3. **By 11 July 2014**, submit a report that summarizes the results of collection of grab samples from the unused onsite water supply well. Samples from the well need to be analyzed for volatile organic constituents. The report needs to include a schedule for cleaning out the well and resampling of the well as originally proposed in a document dated 28 March 2014.

4. **By 11 July 2014,** 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, soil gas, and/or groundwater from the subject property. 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. The proposed tasks must be acceptable to the Central Valley Water Board and sufficient to delineate the lateral and vertical extent of impacts to soil, soil gas, and groundwater.

5. Within **30 days** of approval of the work plan required by Required Action No. 4 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.

6. 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.

7. 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 C, in accordance with the approved time schedule, which shall become part of this Order.

8. 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 Resolution 92-49. The Dischargers 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.

9. 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.

10. 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.

11. 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.

12. Quarterly remediation progress reports shall be submitted once the remediation system has begun operation.

GENERAL REQUIREMENTS

13. 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 the Dischargers shall include a cover letter signed by an authorized representative of the Dischargers, 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. The Dischargers shall also state if it agrees with any recommendations/proposals and whether it approved implementation of said proposals.

14. Conduct work only after Central Valley Water Board staff concurs with the proposed work.

15. 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.

16. Obtain all local and state permits and access agreements necessary to fulfill the requirements of this Order prior to beginning the work.

17. 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.

18. If, for any reason, the Dischargers are 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, Dischargers 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.

19. 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). 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, the Dischargers fail to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $5,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268 and 13350. 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 California Code of Regulations, 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 holiday, 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

or will be provided upon request.

This Order is effective upon the date of signature.

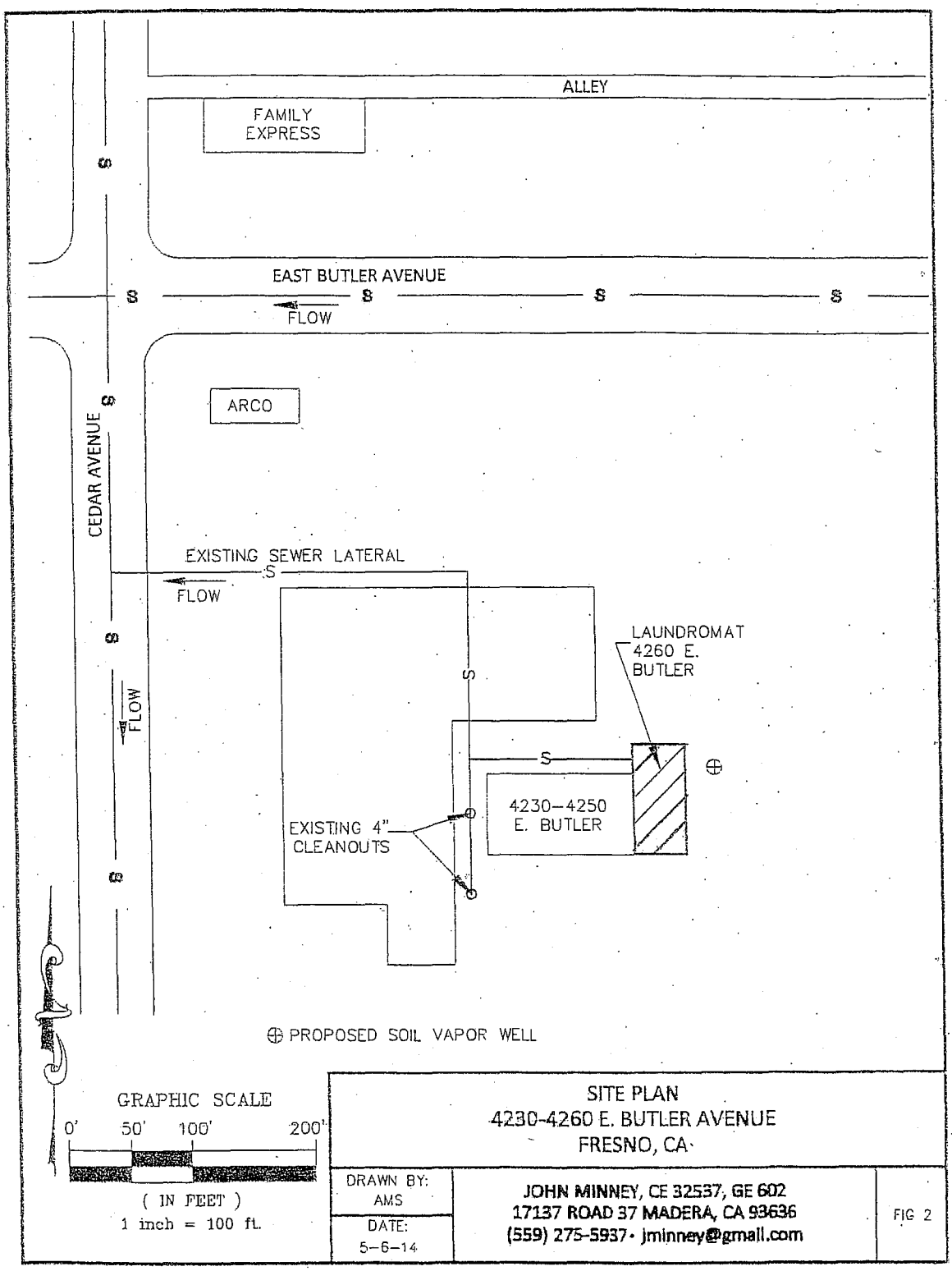
Clay L. Rodgers

CLAY L. RODGERS, Assistant Executive Officer

5/30/14

(Date)

ATTACHMENT A



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;
Locations of above ground and underground storage tanks, septic tanks, leach lines, 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 or other assessment activity 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
Ground water 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 ground water
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 Ground Water 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 ground water, and ground water elevations should be tabulated and included in the report.

Ground Water Gradient and Flow Direction

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

Supporting Data:

A ground water contour map, drawn to scale, should be provided which shows each well, its ground water elevation, and lines of equal ground water elevation. Ground water 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 Permanence
D. Reduction of Toxicity, Mobility, and Volume
E. Short Term Effectiveness
F. Implementability
G. Cost
H. 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 Regional 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