



EDMUND G. BROWN JR.
GOVERNOR



MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

September 5, 2013

Mr. Michael Bower
Project Coordinator
The Boeing Company
5800 Woolsey Canyon Road
MC T-487
Canoga Park, CA 91304

GENERAL WASTE DISCHARGE REQUIREMENTS FOR IN SITU CHEMICAL OXIDATION PILOT TESTING FOR GROUNDWATER REMEDIATION AT SANTA SUSANA FIELD LABORATORY PROPERTY, 5800 WOOLSEY CANYON ROAD, CANOGA PARK, CALIFORNIA 93063 (FILE NO. 12-147, ORDER NO. R4-2007-0019, SERIES NO. 232, CI-9974, GLOBAL ID WDR100009654, EPA ID NO. CAN 000 908 498)

Dear Mr. Bower:

The Los Angeles Regional Water Quality Control Board (Regional Board) staff has completed its review of your application for coverage under General Waste Discharge Requirements (WDR) for In-Situ Chemical Oxidation (ISCO) by injecting potassium permanganate into the fractured bedrock groundwater. We have determined that the proposed discharge meets the conditions specified in Regional Board Order No. R4-2007-0019, "General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic Compound And/Or Hexavalent Chromium Impacted Sites," adopted by this Regional Board on March 1, 2007.

The Boeing Company (Boeing) (hereinafter Discharger) operates portions of the former Santa Susana Field Laboratory (SSFL) (Site) located in the Simi Hills, northwest of Canoga Park, California. The ISCO pilot test is proposed for an area approximately 5 acres in size located near the northeast portion of SSFL within the approximately 25-acre former Instrument and Equipment Laboratories (IEL) Resource Conservation and Recovery Act (RCRA) Facility Investigation site (34.23549° latitude, -118.675726° longitude).

The SSFL IEL Site is located topographically above the south side of the Simi Valley Basin. Results of previous investigations indicate that groundwater has been impacted by chlorinated solvents with the highest detected concentrations of 270 micrograms per liter ($\mu\text{g/L}$) of trichloroethene (TCE) in the IEL Site area from proposed injection well RD-35A.

The Discharger will first conduct a potassium bromide tracer test to evaluate the potential for ISCO as a full-scale corrective measure to address volatile organic compounds (VOCs) in the fractured bedrock. The expected injection rate will be 0.5 to 2 gallons per minute (gpm) of 200 to

MARIA MEHRANIAN, CHAIR | SAMUEL UNGER, EXECUTIVE OFFICER

320 West 4th St., Suite 200, Los Angeles, CA 90013 | www.waterboards.ca.gov/losangeles

2,000 mg/L bromide ion into RD-35A over the course of 2 to 5 days. The injection volume limit over this time period will be 7,500 gallons.

For the ISCO injection test, the Discharger will utilize a solution of potable water and potassium permanganate powder to achieve the desired concentration (target is 2%, but the range may be from 1% to 4%). The ISCO injections will consist of up to 10 injection events spaced one month apart. Each injection event will consist of up to five 8-hour days. The expected injection rates will be 0.5 to 2 gallons per minute (gpm) into RD-35A. As an optional step, the casing may be filled with approximately 300 gallons of potassium permanganate solution at the end of each day, allowing this to enter the formation over night. Based on these target injection rates, it is estimated that approximately 1,200 to 4,800 gallons per event of potassium permanganate solution will be injected in the injection well (or 2,700 to 6,300 gallons per event if potassium permanganate is added to the casing after each daily injection). The injection volume limit over all 10 injections will be 63,000 gallons.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2007-0019 (Series No. 232), Monitoring and Reporting Program (MRP) No. CI-9974, and Standard Provisions Applicable to Waste Discharge Requirements. The Monitoring and Reporting Program requires you to implement the monitoring program on the date you receive this Order.

The Discharger shall comply with the Electronic Submittal of Information (ESI) requirements by submitting all reports required under the MRP, including groundwater monitoring data, discharge location data, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100009654. An ESI training video is available at: <https://waterboards.webex.com/waterboards/ldr.php?AT=pb&SP=MC&rID=44145287&rKey=7dad4352c990334b>

Please see Electronic Submittal for GeoTracker Users, dated December 12, 2011 at: <http://www.waterboards.ca.gov/losangeles/resources/Paperless/Paperless%20Office%20for%20GT%20Users.pdf>

To avoid paying future annual fees, please submit a written request for termination of your enrollment under the general permit in a separate letter, when your project has been completed and the permit is no longer needed. Be aware that the annual fee covers the fiscal year billing period beginning July 1 and ending June 30, the following year. You will pay the full annual fee if your request for termination is made after the beginning of the new fiscal year beginning July 1.

Mr. Michael Bower
The Boeing Company

- 3 -

September 5, 2013

If you have any additional questions, please contact the Project Manager, Mr. David Koo at (213) 620-6155 (dkoo@waterboards.ca.gov) or the Unit Chief, Dr. Eric Wu at (213) 576-6683 (ewu@waterboards.ca.gov).

Sincerely,



Samuel Unger, P.E.
Executive Officer

Enclosures:

- 1) General WDR Order No. R4-2007-0019
- 2) Standard Provisions
- 3) Monitoring and Reporting Program CI-9974

cc: Mr. Roger Paulson, Department of Toxic Substances Control
Mr. Kevin Murdock, CH2M HILL

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2007-0019
REVISED GENERAL WASTE DISCHARGE REQUIREMENTS
FOR
GROUNDWATER REMEDIATION AT PETROLEUM HYDROCARBON FUEL, VOLATILE
ORGANIC COMPOUND AND/OR HEXAVALENT CHROMIUM IMPACTED SITES
(FILE NO. 01-116)

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) finds:

1. Pursuant to Division 7 of the California Water Code, this Regional Board at a public hearing held on January 24, 2002, adopted the General Waste Discharge Requirements (WDRs) (Order No. R4-2002-0030) relative to the groundwater remediation at petroleum hydrocarbon fuel and/or volatile organic compound impacted sites. Subsequent to adoption of the initial general waste discharge requirements (WDRs), these WDRs have been revised to include the use of ozone as a treatment compound and the application and use of trace materials.
2. Since then, however, at sites throughout Los Angeles County, monitoring and municipal production wells have become polluted with dissolved hexavalent chromium. From the Pacoima – Sunland area in the northeastern San Fernando Valley to the basin's narrows in City of Los Angeles and from the northern edge of Central Basin to Long Beach, hexavalent chromium releases have threatened or have directly impacted monitoring or municipal supply wells.
3. Table I (Attachment A) of Order R4-2007-0019 includes a list of materials that can be used for in-situ remediation purposes. Newly added remedial compounds for in-situ reduction are calcium polysulfide, ferrous sulfate, sodium dithionite, and bioremediation agents such as molasses, lactose, cheese whey or starch and emulsified oil have demonstrated that they can effectively convert hexavalent chromium to chromium III, a less toxic and more stable compound. In addition, activated persulfate (KlozurTM) for chemical oxidation has proven to be effective for the remediation of petroleum impacted sites. The revised general WDRs are to include the above to the list of materials approved for in-situ remediation zone treatment purposes and include a brief list of tracer materials that can be utilized at sites to aid in determination of the effectiveness of clean up material application.

4. The California Water Code (CWC), section 13260, subdivision (a)(1) requires that any person discharging wastes, or proposing to discharge wastes other than into a community waste water collection system, which could affect the quality of the waters of the State, shall file a Report of Waste Discharge with the Regional Board. The Regional Board shall then prescribe requirements for the discharge or proposed discharge of wastes.
5. Section 13263, subdivision (i) of the CWC provides that a Regional Board may prescribe general waste discharge requirements for discharges produced by similar operations, involving similar types of wastes, and requiring similar treatment standards.
6. The adoption of general WDRs for in-situ groundwater remediation/cleanup or the extraction of polluted groundwater with above ground treatment and the return of treated groundwater to the same aquifer zone would: a) simplify the application process for dischargers, b) allow more efficient use of Regional Board staff time, c) reduce Regional Board time by enabling the Executive Officer to notify the discharger of the applicability of the general WDRs, d) enhance the protection of surface water quality by eliminating the discharge of wastewater to surface waters, and e) provide a level of protection comparable to individual, site-specific WDRs.
7. Petroleum hydrocarbon fuel, volatile organic compound and hexavalent chromium contaminated groundwater at various sites throughout the Los Angeles region and cause or threaten to cause adverse impacts to existing and potential beneficial uses of the region's groundwater resources. Remediation/cleanup of groundwater at these sites includes the use and application of chemical, biological, and physical treatment processes, such as, chemical oxidation, chemical reduction, oxygen enhanced process, nutrient or chemical addition for enhanced biodegradation, or groundwater pump and treat technology with the return of treated groundwater to the same aquifer zone in some cases.
8. The application of any material to groundwater may result in unintended adverse impacts to groundwater quality. Any potential adverse water quality impacts that may result will be localized, of short-term duration, and will not impact any existing or prospective beneficial uses of groundwater. Groundwater quality will be monitored before addition of any materials, during treatment, and after treatment is completed to verify no long-term adverse impact to water quality.
9. The implementation of in-situ cleanup may require a small-scale pilot testing program or demonstration study prior to the design and implementation of a full-scale remediation project. The discharges from the pilot test programs or demonstration study are also covered under these general WDRs.

10. The Regional Board adopted a revised Water Quality Control Plan (Basin Plan) for the Los Angeles Region on June 13, 1994. The Basin Plan contains water quality objectives and lists the beneficial uses of groundwater in the Los Angeles region. Beneficial uses of groundwater in the Los Angeles region include, among others: municipal and domestic supply, industrial service and process supply, agricultural supply and groundwater recharge. Beneficial uses for individual hydrologic sub-areas are specified in the Basin Plan. See Attachment B Table 3-10 water quality objectives for selected constituents in regional groundwaters.
11. The release of petroleum hydrocarbon fuel, volatile organic compounds and hexavalent chromium, at many sites within the Los Angeles region affects only shallow groundwater sources. Many of the shallow groundwater zones contain general mineral content (total dissolved solids, chloride, and sulfate, etc.) in concentrations, which are considered to be naturally occurring and not the result of pollution that may exceed Basin Plan Objectives for these constituents. Treated groundwater that exhibits general mineral content that are naturally occurring and exceeds Basin Plan Objectives may be returned to the same groundwater formations from which it is withdrawn, with concentrations not exceeding the original background concentrations for the site.
12. Treated groundwater that exhibits general mineral content that is naturally occurring and exceeds Surface Water Basin Plan Objectives must be treated if discharged into surface waters under a separate National Pollutant Discharge Elimination System (NPDES) Permit.
13. The general WDRs are applicable to groundwater remediation projects at, petroleum hydrocarbon fuel, volatile organic compound and hexavalent chromium impacted sites. Depending on the Report of Waste Discharge, the Executive Officer determines the annual fee based on the threat to water quality and complexity of the discharge. The general WDRs are to regulate groundwater discharges that have a threat to water quality of Category 3 and Complexity rating of A for a combined rating of 3-A.
14. Discharges with a rating of 3-A contain pollutants that could degrade water quality or cause a minor impairment of designated beneficial uses within the application area of the receiving groundwater. The discharges covered by these requirements will have a groundwater monitoring program to comply with requirements prescribed in this Order.
15. The requirements contained in this Order were established by considering, and are consistent with, all the water quality control policies, plans, and regulations mentioned above and, if they are met, will protect and maintain the existing beneficial uses of the receiving groundwater.
16. The permitted discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16 (Anti-degradation Policy). The impact on

existing water quality will not be significant in comparison to individual WDRs, and the general WDRs will improve the quality of the affected groundwater.

17. These general WDRs are not intended to alter or supersede any existing restrictions or working arrangements relating to cleanup cases with local governmental agencies.
18. In accordance with the Governor's Executive Order requiring any proposed activity be reviewed to determine whether such activity will cause additional energy usage, this Regional Board has determined that implementation of these general WDRs will not result in a change in energy usage exceeding what would be used if site-specific WDRs were issued for cleanup at these sites.
19. The Regional Board has prepared an Initial Study and Mitigated Negative Declaration for the issuance of these general WDRs in accordance with the provisions of the California Environmental Quality Act (CEQA).
20. The Regional Board has notified interested agencies and persons of its intent to prescribe general WDR's for the discharges covered under these general WDRs, and has provided them with an opportunity to submit their written views and recommendations for the requirements.
21. The Regional Board, in a public meeting, heard and considered all comments pertaining to the tentative general WDRs.

IT IS HEREBY ORDERED THAT dischargers authorized under this Order shall meet the provisions contained in Division 7 of the California Water Code, and regulations adopted here under, by complying with the following:

A. ELIGIBILITY

1. A discharger may seek coverage under this Order for:
 - a. existing and future discharges to groundwater of remediation compounds from the cleanup of petroleum hydrocarbon fuel, volatile organic compound and/or hexavalent chromium impacted sites and similar discharges.
 - b. re-injection, percolation or infiltration of treated groundwater from a pump and treat remediation system(s).
2. To be covered under this Order, a discharge must meet the following criteria:
 - a. The Executive Officer must find, based on the Report of Waste Discharge submitted pursuant to Provision C, that the groundwater discharges for which coverage under this Order are sought have a threat to water quality of Category 3

and Complexity rating of A for a combined rating of 3-A, using the rating criteria noted (see on the Regional Board website at:
[http://www.waterboards.ca.gov/losangeles/html/permits/fee_schedule/fee%20schedules%20\(2004-005\).pdf](http://www.waterboards.ca.gov/losangeles/html/permits/fee_schedule/fee%20schedules%20(2004-005).pdf)

- b. The discharger must have an approved Remediation Action Plan (RAP). The discharger shall submit a copy of the approved RAP including any conditions of implementation with the Report of Waste Discharge for application of the general WDRs. At a minimum, the RAP shall include the following site-specific information:
- The background water quality of the aquifer of the groundwater remediation site(s) including contaminant types, total dissolved solids, sulfates, chlorides, nitrogen (NH₄, NO₃, NO₂), chemical oxygen demand, biological oxygen demand, phosphorus, pH, dissolved metals, nutrients, dissolved oxygen, dissolved carbon dioxide, methane, temperature, iron, and oxidation-reduction potential;
 - Information on any potential adverse impacts to groundwater quality, and whether the impacts will be localized and short-term;
 - The results of any pilot testing performed for the treatment technology to be used;
 - Site-specific geology (lithology and physical parameters) and hydrogeologic parameters, hydrologic report;
 - Infiltration rate;
 - Characterization and extent of petroleum hydrocarbon fuel, volatile organic compound and hexavalent chromium plume(s);
 - Description of the treatment system(s);
 - Adequate groundwater monitoring network with historical groundwater monitoring report;
 - Description of the aerial extent of the application area and identification of monitoring wells to be used to determine water quality upgradient, within the application area, downgradient from the application area and identify the compliance point;
 - Material Safety Data Sheet (MSDS) information and other product technical information for any materials to be used for cleanup;
 - Application rate(s), material type(s) and applied concentrations; and
 - Evaluation of loading rates for nitrogen compounds, total dissolved solids, sulfate, and chloride compounds.

- c. The General Waste Discharge Requirements would allow the following materials to be used for in-situ remediation purposes:

1. Oxidation/Aerobic Degradation Enhancement Compounds:

- Fenton's reagent (hydrogen peroxide, ferrous iron catalyst, and pH buffer)
- Hydrogen peroxide
- Potassium or sodium permanganate
- Oxygen release compound (ORC) magnesium peroxide
- Ozone
- Activated Persulfate (Klozur™)

2. Reducing/Reductive Degradation Enhancement Compounds (Table I):

- Calcium Polysulfide (Inorganic)
- Ferrous Sulfate (Inorganic)
- Ferrous Chloride (Inorganic)
- Sodium Dithionite (Inorganic)
- Zero-valent iron (Inorganic)
- Bio-remediation (Organic) using:
 - Molasses,
 - Lactose,
 - Cheese Whey and/or
 - Starch
 - Sodium Lactate
 - Ethanol
 - Emulsified Oil
 - Corn Syrup
 - Hydrogen Release Compound (HRC)–{proprietary}

3. Inorganics/Nutrients:

- Nitrate, ammonia, phosphate, vitamins

4. Carbon Sources/Electron Donors:

- Acetate, lactate, propionate, benzoate, oleate, ethanol, propanol, methanol, glucose, complex sugars such as molasses or corn syrup, other food process byproducts such as milk whey or yeast extract, other complex organic material such as wood chips

5. Study tracer compounds:

- The tracer compounds shall be highly contrast and not reactive with current contaminants to be treated. The tracers may be chloride-based and bromide-based salts, such as sodium-flouroscein, calcium chloride, sodium chloride, calcium bromide, sodium bromide, potassium bromide, potassium, iodide, Rhodamine WT, rhodamine (D), eosine, and fluoride salts, or similar materials as approved by the Executive Officer.
3. In applying these general WDRs, the monitoring program shall address changes in geochemistry that may alter the potential occurrence of transference of chromium (III) into chromium (VI), or vice versa, during the oxidation or reduction process in the in-situ remediation under these WDRs.
 4. For the purpose of renewal of existing individual requirements with these general WDRs, provided that all the conditions of these general WDRs are met, renewal is effective upon issuance of a notification by the Executive Officer and issuance of a new monitoring and reporting program.
 5. When the individual WDRs with more specific requirements are issued to a discharger, the applicability of this Order to that discharger is automatically terminated on the effective date of the individual WDRs.

B. AUTHORIZATION

To be authorized to discharge under this Order, the discharger must submit a Report of Waste Discharge in accordance with the requirements of Part C of this Order. Upon receipt of the application, the Executive Officer shall determine the applicability of this Order to such a discharge and the completeness of the application package. If the discharge is eligible, the Executive Officer shall notify the discharger that the discharge is authorized under the terms and conditions of this Order and prescribe an appropriate monitoring and reporting program. For new discharges, the discharge shall not commence until receipt of the Executive Officer's written determination and the discharger receives general WDRs to include a site specific monitoring and reporting program.

C. REPORT OF WASTE DISCHARGE

1. Deadline for Submission

- a. Renewal of permits of existing dischargers covered under individual WDRs that meet the eligibility criteria in Part A and have submitted Report of Waste Discharge will consist of a letter of determination from the Executive Officer of coverage under this Order.
 - b. New dischargers shall file a complete application to include all information identified in Items A1, A2 and as above at least 60 days before planned commencement of any discharge.
2. Forms for Report of Waste Discharge
- a. Dischargers shall use the appropriate forms (Standard Form 200) or equivalent forms approved by the State Water Resources Control Board or the Executive Officer of the Los Angeles Regional Board.
 - b. The discharger, upon request, shall submit any additional information that the Executive Officer deems necessary to determine whether the discharge meets the criteria for coverage under this Order, and/or in prescribing an appropriate monitoring and reporting program.
 - c. The Report of Waste Discharge shall be accompanied by the first annual fee (if appropriate) in accordance with the current version of California Code of Regulation, Title 23, Division 7, Chapter 9, Waste Discharge Report and Requirements Article 1 fees for a discharge. The check or money order shall be made payable to the "State Water Resources Control Board."

D. DISCHARGE PROHIBITIONS

1. The discharge of wastes other than those which meet eligibility requirements in Part A of this Order is prohibited unless the discharger obtains coverage under another general permit or an individual site specific permit that regulates the discharge of such wastes.
2. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.
3. Creation of a pollution, contamination, or nuisance, as defined by section 13050 of the California Water Code (CWC), is prohibited.
4. The surfacing as overflow of wastes from the treatment system at any time and at any location is prohibited.

5. The disposal of wastes in geologically unstable areas or so as to cause earth movement is prohibited.

E. DISCHARGE LIMITATIONS

1. The discharge of wastes shall not cause the pH of the receiving groundwater at the compliance point, downgradient outside the application area, beyond the range of 6.5 and 8.5.
2. The discharge of wastes shall not cause the mineral constituents of the receiving groundwater at the compliance point, downgradient outside the application area, in excess of applicable limits given in Attachment B. In the letter of determination, the Executive Officer shall indicate the groundwater limitations in Attachment B applicable to the particular discharge, and identify the compliance point(s) for the site.
3. The discharge of wastes shall not cause the concentrations of chemical constituents and radionuclides of the receiving groundwater designated for use as domestic or municipal supply at the compliance point, downgradient outside the application area, in excess of the Maximum Contaminate Levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into the Basin Plan: Table 64431-A of section 64431 (inorganic chemicals), Table 64431-B of section 64431 (fluoride), Table 64444-A of section 64444 (organic chemicals), and Table 4 of section 64443 (radioactivity). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.
4. Waste discharged shall not cause the concentration of coliform organisms over any seven days period greater than 1.1/100ml.
5. Waste discharged shall not contain salts, heavy metals, or organic pollutants at levels that would cause receiving groundwater at the compliance point, downgradient outside the application area, to exceed the water quality objectives for groundwater or groundwater that may be in hydraulic connection with surface waters designated for marine aquatic life or body contact recreation.
6. Waste discharged shall not cause the groundwater to contain concentrations of chemical substances or its by-products in amounts that adversely affect any designated beneficial use, outside the application area or treatment zone at the compliance point(s).

7. Waste discharged shall not cause the groundwater to contain residual taste or odor in concentrations that cause nuisance or adversely affect beneficial uses, outside the application area or treatment zone at the compliance point(s).
8. Waste discharged shall not cause the groundwater to contain in amounts that cause nitrogen as nitrate-nitrogen plus nitrite-nitrogen ($\text{NO}_3\text{-N} + \text{NO}_2\text{-N}$), 45 mg/L as Nitrate (NO_3), 10 mg/L as nitrate-nitrogen ($\text{NO}_3\text{-N}$), or 1 mg/L as nitrite-nitrogen ($\text{NO}_2\text{-N}$), outside the application area or treatment zone at the compliance point(s).

F. PROVISIONS

1. The Executive Officer may require any discharger authorized under this Order to apply for and obtain individual WDRs with specific requirements. The Executive Officer may require any discharger authorized to discharge under this permit to apply for individual WDRs only if the discharger has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of the individual requirements, the authority to discharge under this General WDRs are no longer applicable.
2. This Order includes the attached "Tentative Standard Provisions Applicable to Waste Discharge Requirements." (Attachment C) If there is any conflict between provisions stated herein before and the attached "Standard Provisions," those provisions stated herein shall prevail.
3. Adequate facilities shall be provided to divert surface and storm water away from the application area and/or treatment system and areas where any pollutants are stored.
4. The application of materials or the re-injection of treated groundwater shall only be at a site owned or controlled by the discharger.
5. All work must be performed by or under the direction of a registered civil engineer, registered geologist, or certified engineering geologist. A statement is required in all technical reports that the registered professional in direct responsible charge actually supervised or personally conducted all the work associated with the project.
6. The discharge of wastes to or infiltration to a surface water system must be covered by separate WDRs under the National Pollution Discharge Elimination System (NPDES) permit.

7. This Order does not alleviate the responsibility of discharger to obtain other necessary local, state, and federal permits to construct facilities necessary for compliance with this Order; nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency. Additionally, the discharger shall notify the Native American Heritage Commission of any plans to disturb the soil in order to comply with California Environmental Quality Act (CEQA) guidelines as set forth in Section 15064.5(b)(c). Furthermore the discharger is required to provide local information prior to excavation to the California Historic Resources Information Center (CHRIS). This will serve as their due diligence record search to provide proximity to Native American historical and archeological resources. The discharger shall also be required to adhere to California Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98, CEQA Section 15064.5(d) and Section 15064.5 (f) to ensure that mitigation plan provisions are in-place to identify, evaluate and consult with your commission about the discovery and disposition of any recovered human remains or artifacts, should the occasion arise, during the remediation process overseen by this agency.
8. The discharger shall notify Regional Board staff by telephone within 24 hours, followed by written notification within one week; in the event it is unable to comply with any of the conditions of this Order due to:
 - a) Breakdown of waste treatment equipment,
 - b) Accident caused by human error or negligence,
 - c) Other causes such as acts of nature, or
 - d) Site construction or development operations.
9. Any discharger authorized under this Order may request to be excluded from coverage of this Order by applying for an individual permit.
10. In accordance with section 13263(e) of the California Water Code, these requirements are subject to periodic review and revision by the Regional Board within a five (5) year cycle.
11. In accordance with Water Code section 13263(g), these requirements shall not create a vested right to continue to discharge and are subject to rescission or modification. All discharges of waste into waters of the state are privileges, not rights.
12. The discharger shall develop a contingency plan and maintain it on site. The contingency plan shall detail appropriate actions to be taken in order to protect human health and the

environment in case of any spill or failure related to the operation or mis-operation of the treatment system.

G. MONITORING AND REPORTING REQUIREMENTS

1. The Executive Officer is hereby authorized to prescribe a Monitoring and Reporting Program for each authorized discharger. This program may include participation of the discharger in a regional monitoring program.
2. The discharger shall file with the Regional Board technical reports on self-monitoring work conducted according to the Monitoring and Reporting Program specified by the Executive Officer and submits other reports as requested by the Regional Board.
3. The discharger shall retain records of all monitoring information and data used to complete the Report of Waste Discharge and application for coverage under this Order for at least five years from the date of permit issuance. The retention period shall be extended during any unresolved litigation regarding the discharge or when requested by the Executive Officer.
4. The discharger shall maintain all sampling, measurement and analytical results, including the date, exact place, and time of sampling or measurement; individual(s) who did the sampling or measurement; the date(s) analyses were done; analysts' names; and analytical techniques or methods used.
5. All sampling, sample preservation, and analyses must be conducted according to test procedures under title 40 Code of Federal Regulations, section 136, unless other test procedures have been specified in this Order or by the Executive Officer.
6. All chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services Environmental Laboratory Accreditation Program (CDHS-ELAP) or other state agency authorized to undertake such certification.
7. The discharger shall calibrate and maintain all monitoring instruments and equipment to insure accuracy of measurements, or shall insure that both activities will be conducted.
8. In reporting the monitoring data, the discharger shall arrange the data in tabular form so that the date, constituents, and concentrations are readily discernible. The data shall be summarized to demonstrate compliance with waste discharge requirements. Laboratory

analytical data from any soil testing and/or groundwater monitoring shall be reported in Electronic Deliverable Format in accordance with California Water Code section 13195 et. seq. requirements, if applicable.

9. For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.
10. The discharger shall file a report of any material change or proposed change in the character, location or volume of the discharge.
11. The discharger shall notify this Regional Board within 24 hours by telephone of any adverse condition resulting from the discharge; such notification shall be affirmed in writing within five working days.
12. Whenever wastes, associated with the discharge under this Order, are transported to a different disposal site, the following shall be reported in the monitoring report: type and quantity of wastes; name and address of the hauler (or method of transport if other than by hauling); and location of the final point(s) of disposal.
13. Each monitoring report must contain an affirmation in writing that:

"All analyses were conducted at a laboratory certified for such analyses by _____ and in accordance with current USEPA procedures or as specified in this Monitoring and Reporting Program."

14. Each report shall contain the following completed declaration:

"I declare under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who managed the system or those directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Groundwater Remediation at
Petroleum Hydrocarbon Fuel, Volatile Organic Compound
And / or Hexavalent Chromium Impacted Sites
Order No. R4-2007-0019

File No. 01-116

Executed on the ___ day of _____ at _____.

(Signature)
(Title)"

H. EXPIRATION DATE AND CONTINUATION OF THIS ORDER

This Order expires on March 1, 2012; however, for those dischargers authorized to discharge under this Order, it shall continue in full force and effect until a new order is adopted.

I. REAUTHORIZATION

Upon re-issuance of a new general permit Order, dischargers authorized under this Order shall file a new Report of Waste Discharge within 45 days of notification by the Executive Officer.

I, Jonathan S. Bishop, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on March 1, 2007.


Jonathan S. Bishop
Executive Officer

STANDARD PROVISIONS
APPLICABLE TO WASTE DISCHARGE REQUIREMENTS

1. DUTY TO COMPLY

The discharger must comply with all conditions of these waste discharge requirements. A responsible party has been designated in the Order for this project, and is legally bound to maintain the monitoring program and permit. Violations may result in enforcement actions, including Regional Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Regional Board. [CWC Section 13261, 13263, 13265, 13300, 13301, 13304, 13340, 13350]

2. GENERAL PROHIBITION

Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC). [H&SC Section 5411, CWC Section 13263]

3. AVAILABILITY

A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. [CWC Section 13263]

4. CHANGE IN OWNERSHIP

The discharger must notify the Executive Officer, in writing at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage to a new discharger containing a specific date for the transfer of this Order's responsibility and coverage between the current discharger and the new discharger. This agreement shall include an acknowledgement that the existing discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date on. [CWC Sections 13267 and 13263]

5. CHANGE IN DISCHARGE

In the event of a material change in the character, location, or volume of a discharge, the discharger shall file with this Regional Board a new Report of Waste Discharge. [CWC Section 13260(c)]. A material change includes, but is not limited to, the following:

- (a) Addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the Waste.

November 7, 1990
WDR

Standard Provisions Applicable to
Waste Discharge Requirements

- (b) Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.
- (c) Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.
- (d) Increase in flow beyond that specified in the waste discharge requirements.
- (e) Increase in the area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements. [CCR Title 23 Section 2210]

6. REVISION

These waste discharge requirements are subject to review and revision by the Regional Board. [CCR Section 13263]

7. TERMINATION

Where the discharger becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information. [CWC Sections 13260 and 13267]

8. VESTED RIGHTS

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the discharger from his liability under Federal, State or local laws, nor do they create a vested right for the discharger to continue the waste discharge. [CWC Section 13263(g)]

9. SEVERABILITY

Provisions of these waste discharge requirements are severable. If any provision of these requirements are found invalid, the remainder of the requirements shall not be affected. [CWC Section 921]

Standard Provisions Applicable to
Waste Discharge Requirements

10. OPERATION AND MAINTENANCE

The discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order. [CWC Section 13263(f)]

11. HAZARDOUS RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) that person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with Section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Board or the appropriate Regional Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of Section 13271 of the Water Code unless the discharger is in violation of a prohibition in the applicable Water Quality Control plan. [CWC Section 1327(a)]

12. PETROLEUM RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) such person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan. [CWC Section 13272]

Standard Provisions Applicable to
Waste Discharge Requirements

13. ENTRY AND INSPECTION

The discharger shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

- (a) Enter upon the discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
- (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
- (d) Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order, or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

14. MONITORING PROGRAM AND DEVICES

The discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer, which specifications are subject to periodic revisions as may be warranted. [CWC Section 13267]

All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the discharger shall submit to the Executive Office a written statement, signed by a registered professional engineer, certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required.

Unless otherwise permitted by the Regional Board Executive officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. The Regional Board Executive Officer may allow use of an uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside the State boundaries and therefore not subject to certification. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" [40CFR Part 136] promulgated by the U.S. Environmental Protection Agency. [CCR Title 23, Section 2230]

Standard Provisions Applicable to
Waste Discharge Requirements

15. TREATMENT FAILURE

In an enforcement action, it shall not be a defense for the discharger that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the discharger shall, to the extent necessary to maintain compliance with this Order, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost. [CWC Section 13263(f)]

16. DISCHARGE TO NAVIGABLE WATERS

Any person discharging or proposing to discharge to navigable waters from a point source (except for discharge of dredged or fill material subject to Section 404 of the Clean Water Act and discharge subject to a general NPDES permit) must file an NPDES permit application with the Regional Board. [CCR Title 2 Section 22357]

17. ENDANGERMENT TO HEALTH AND ENVIRONMENT

The discharger shall report any noncompliance which may endanger health or the environment. Any such information shall be provided verbally to the Executive Officer within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within five days of the time the discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. The following occurrence(s) must be reported to the Executive Office within 24 hours:

- (a) Any bypass from any portion of the treatment facility.
- (b) Any discharge of treated or untreated wastewater resulting from sewer line breaks, obstruction, surcharge or any other circumstances.
- (c) Any treatment plan upset which causes the effluent limitation of this Order to be exceeded. [CWC Sections 13263 and 13267]

18. MAINTENANCE OF RECORDS

The discharger shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and record of all data used

Standard Provisions Applicable to
Waste Discharge Requirements

to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Records of monitoring information shall include:

- (a) The date, exact place, and time of sampling or measurement;
 - (b) The individual(s) who performed the sampling or measurement;
 - (c) The date(s) analyses were performed;
 - (d) The individual(s) who performed the analyses;
 - (e) The analytical techniques or method used; and
 - (f) The results of such analyses.
19. (a) All application reports or information to be submitted to the Executive Office shall be signed and certified as follows:
- (1) For a corporation – by a principal executive officer or at least the level of vice president.
 - (2) For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.
 - (3) For a municipality, state, federal, or other public agency – by either a principal executive officer or ranking elected official.
- (b) A duly authorized representative of a person designated in paragraph (a) of this provision may sign documents if:
- (1) The authorization is made in writing by a person described in paragraph (a) of this provision.
 - (2) The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
 - (3) The written authorization is submitted to the Executive Officer.

Any person signing a document under this Section shall make the following certification:

Standard Provisions Applicable to
Waste Discharge Requirements

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. [CWC Sections 13263, 13267, and 13268]"

20. OPERATOR CERTIFICATION

Supervisors and operators of municipal wastewater treatment plants and privately owned facilities regulated by the PUC, used in the treatment or reclamation of sewage and industrial waste shall possess a certificate of appropriate grade in accordance with Title 23, California Code of Regulations Section 3680. State Boards may accept experience in lieu of qualification training. In lieu of a properly certified wastewater treatment plant operator, the State Board may approve use of a water treatment plant operator of appropriate grade certified by the State Department of Health Services where reclamation is involved.

Each plan shall be operated and maintained in accordance with the operation and maintenance manual prepared by the municipality through the Clean Water Grant Program [CWC Title 23, Section 2233(d)]

ADDITIONAL PROVISIONS APPLICABLE TO
PUBLICLY OWNED TREATMENT WORKS' ADEQUATE CAPACITY

21. Whenever a publicly owned wastewater treatment plant will reach capacity within four years the discharger shall notify the Regional Board. A copy of such notification shall be sent to appropriate local elected officials, local permitting agencies and the press. The discharger must demonstrate that adequate steps are being taken to address the capacity problem. The discharger shall submit a technical report to the Regional Board showing flow volumes will be prevented from exceeding capacity, or how capacity will be increased, within 120 days after providing notification to the Regional Board, or within 120 days after receipt of notification from the Regional Board, of a finding that the treatment plant will reach capacity within four years. The time for filing the required technical report may be extended by the Regional Board. An extension of 30 days may be granted by the Executive Officer, and longer extensions may be granted by the Regional Board itself. [CCR Title 23, Section 2232]

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-9974
FOR
THE BOEING SANTA SUSANA FIELD LABORATORY IN-SITU CHEMICAL OXIDATION
FIELD EXPERIMENT PROJECT
INSTRUMENT AND EQUIPMENT LABORATORIES AREA
CANOGA PARK, CA 93063

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2007-0019 (SERIES NO. 232)
FILE NO. 12-147

I. REPORTING REQUIREMENTS

- A. The Boeing Company (hereinafter Discharger) shall implement this Monitoring and Reporting Program (MRP) at the Santa Susana Field Laboratory (SSFL), Instrument and Equipment Laboratories (IEL) Area, Canoga Park, California, the location of which is shown on Figure 1, on the effective date of this enrollment (September 5, 2013) under Regional Board Order No. R4-2007-0019. Because the baseline sampling event will take place in the Fourth Quarter of 2013, the first monitoring report under this monitoring program is due by January 15, 2014.

Monitoring reports shall be received by the dates in the following schedule:

<u>Reporting Period</u>	<u>Report Due</u>
January – March	April 15
April – June	July 15
July – September	October 15
October – December	January 15

- B. If there is no discharge or injection during any reporting period, the report shall so state.
- C. By January 15th of each year, beginning January 15, 2014, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken, or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.
- D. Laboratory analyses – all chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP). A copy of the laboratory certifications shall be provided each time a new and/or renewal is obtained from ELAP.

- E. The method limits (MLs) employed for effluent analyses shall be lower than the permit limits established for a given parameter, unless the Discharger can demonstrate that a particular ML is not attainable and obtains approval for a higher ML from the Executive Officer. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and the associated laboratory quality assurance/quality control (QA/QC) procedures.
- F. All QA/QC samples must be run on the same dates when samples were actually analyzed. The Discharger shall make available for inspection and/or submit the QA/QC documentation upon request by Regional Board staff. Proper chain of custody procedures must be followed and a copy of the chain of custody documentation shall be submitted with the report.
- G. Each monitoring report must affirm in writing that "All base scope analyses were conducted at a laboratory certified for such analyses by the California Department of Health Services, and in accordance with current United States Environmental Protection Agency (USEPA) guideline procedures or as specified in this Monitoring Program." Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report.
- H. For every item where the requirements are not met, the Discharger shall submit a statement of the cause(s), and actions undertaken or proposed which will bring the discharge into full compliance with waste discharge requirements at the earliest possible time, including a timetable for implementation of those actions.
- I. The Discharger shall maintain all sampling and analytical results, including strip charts, date, exact place, and time of sampling, dates analyses were performed, analyst's name, analytical techniques used, and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- J. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements and, where applicable, shall include results of receiving water observations.
- K. Any mitigation/remedial activity including any pre-discharge treatment conducted at the site must be reported in the quarterly monitoring report.
- L. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with WDRs. This section shall be located at the front of the report and shall

clearly list all non-compliance with discharge requirements, as well as all excursions of effluent limitations.

- M. The Discharger shall comply with requirements contained in Section G of Order No. R4-2007-0019 "*Monitoring and Reporting Requirements*" in addition to the aforementioned requirements.

II. INJECTION MONITORING REQUIREMENTS

Reagent Injections - An injection test (field pilot test) shall be performed at the site per the "*Work Plan Addendum #1, In-Situ Chemical Oxidation Field Experiment*" (Work Plan Addendum). The injection utilizes potassium permanganate solution mixed with potable water. The injection flow rates, potassium permanganate concentrations, and durations may vary from specific values included in the Work Plan Addendum based on observed head and water quality conditions, and these changes shall be based on advance California Department of Toxic Substances Control (DTSC) approval.

Prior to the first In-Situ Chemical Oxidation (ISCO) injection event, a potassium bromide tracer test shall be conducted. The tracer test shall consist of 2 to 5 days of potassium bromide addition, followed by several weeks of field parameter monitoring from the monitoring well network.

The quarterly reports shall contain the following information regarding the injection activities. If there is no injection during any reporting period, the report shall so state.

1. Location map showing injection wells for the oxidant or tracer solution.
2. Written summary defining:
 - Depth of injection;
 - Total volume and concentration of the reagent solution injected;
 - Reagent injection flow rate; and
 - Reagent injection pressures.

III. GROUNDWATER MONITORING PROGRAM FOR THE REMEDIATION PROJECT

A groundwater monitoring program shall be designed to detect and evaluate impacts associated with the injection activities. A tracer test shall be conducted first, followed by the ISCO injection events, and both will be conducted at well RD-35A. The tracer test shall include 2-5 days of tracer solution injection, followed by 4 to 6 weeks of monitoring at groundwater monitoring wells RD-105, RD-106, RD-107, C-1, C-10, C-18, RD-35B, and RD-73. The tracer shall include potassium bromide, mixed to a target injection concentration of approximately 200 to 2,000 milligrams per liter (mg/L).

After the tracer test monitoring period is complete, the ISCO injection shall be conducted. Tables 1 and Table 2, below, identify the constituents that shall be analyzed during the baseline sampling event (about one month prior to the tracer or ISCO injection

date) and subsequent groundwater monitoring events during the monitoring period for the purpose of evaluating the effectiveness of the tracer and the injection.

For the tracer test, the Monitoring and Reporting Program shall include eight (8) *primary* groundwater monitoring wells which are located closest to the injection well) - RD-105, RD-106, RD-107, C-1, C-10, C-18, RD-35B, and RD-73. For the ISCO injection, the same primary wells shall be monitored, with the addition of four (4) *secondary* monitoring wells (located further from or deeper than the injection well - RD-31, RD-35C, RD-37, and RD-72), and three *tertiary* monitoring wells (located furthest from the injection well - HAR-24, HAR-25, and WS-14). The locations of the monitoring wells are shown on Figure 2 (attached). These sampling stations shall not be changed and any proposed change of monitoring locations shall be identified and approved by the Regional Board Executive Officer (Executive Officer) prior to their use.

TABLE 1. BROMIDE TRACER TEST SAMPLING SCHEDULE

Parameter	Analytical Method	Sampling Frequency		
		Baseline	During Tracer Addition to First Arrival, Every 1-10 Days	Post-Tracer Arrival (Every 3-21 Days)
PRIMARY WELLS ONLY (RD-105, RD-106, RD-107, C-1, C-10, C-18, RD-35B, RD-73)				
DO, ORP, specific conductance, pH, temperature	Field measured using flow-through cell	X	X	X
Bromide	Hach® Field Test Kit, ion-specific electrode, and/or EPA 300.0	X	X	X

- NOTES: (1) Sampling frequency above is estimated minimum monitoring required; additional monitoring may be conducted as needed. Samples will be submitted for laboratory confirmation of field-measured bromide at a frequency of 10%.
 (2) Baseline sampling consists of single sampling event about one month prior to the start of the tracer study.
 (3) During tracer addition, frequent monitoring shall be conducted to monitor "first arrival." It is expected that more frequent sampling shall be needed at wells closer to the injection well or along flow pathways from the injection well, whereas more distant wells or those that may not be located along flow pathways shall be monitored less frequently.
 (4) After tracer addition is complete, less frequent monitoring shall be conducted to monitor "tail" of the breakthrough curve. Similar to the tracer addition period, it is expected that more frequent sampling shall be needed at wells closer to the injection well or along flow pathways from the injection well, whereas more distant wells or those that may not be located along flow pathways shall be monitored less frequently.
 (5) Some of the individual ports in the multi-port wells may not show response from the tracer test, and the monitoring frequency may be reduced for these ports upon the approval of the Regional Board Executive Officer.
 (6) Some secondary wells (identified in Table 2) may be monitored if breakthrough is observed at the primary wells.
 (7) Due to uncertainty in predicting the duration of a tracer study, the monitoring shall continue until the Regional Board is notified that the tracer study is complete.
 X Test for parameter

The water quality results collected during the ISCO performance monitoring program, as presented in Table 2, will be used to evaluate the total distance that the potassium permanganate solution has traveled, and the associated timeframe. The travel distance and time will depend on many factors, including the natural oxidant demand of the formation and the degree to which there are interconnected fractures between the injection well and the

monitoring well ports. The arrival of potassium permanganate may be observed within days in the nearby primary wells, and within weeks, or not at all, in the more distant primary wells and secondary/tertiary wells. Potassium permanganate can persist and remain reactive for several weeks in the subsurface. The purpose of the multiple injections is to create a sustained concentration gradient that will provide for diffusion of oxidant from the fractures into the adjacent rock matrix blocks, where a majority of the contaminant mass is expected to be present.

TABLE 2. ISCO PILOT TEST SAMPLING SCHEDULE

Parameter	Analytical Method	Sampling Frequency		
		Baseline	Weekly Monitoring (X or C)	Monthly (M), Quarterly (Q), or Semi-Annual (S) Analytical Sampling
PRIMARY WELLS (RD-105, RD-106, RD-107, C-18, RD-35B, RD-73, C-1, C-10)				
DO, ORP, spec. cond., pH, temp.	Field measured, flow-through cell	X	X*	
Permanganate	Field Colorimeter	X	X*	
VOCs	EPA Method 8260B	X	X*	M
Dissolved metals (includes K and Mn)	EPA Methods 6010B and/or 6020	X		M
Anions (bromide, chloride, nitrate, sulfate, bicarbonate)	EPA Method 300.0 (SM 2320B for bicarbonate)	X		M
Boron	EPA Method 200.7	X		M
TDS	SM 2540C	X		M
SECONDARY WELLS (RD-31, RD-35C, RD-37, RD-72)				
DO, ORP, spec. cond, pH, temp	Field measured, flow-through cell	X	C	Q
Permanganate	Field Colorimeter	X	C	Q
VOCs	EPA Method 8260B	X		Q
Dissolved metals (includes K and Mn)	EPA Methods 6010B and/or 6020	X		Q
Anions (bromide, chloride, nitrate, sulfate, bicarbonate)	EPA Method 300.0 (SM 2320B for bicarbonate)	X		Q
Boron	EPA Method 200.7	X		Q
TDS	SM 2540C	X		Q

TERTIARY WELLS (HAR-24, HAR-25, WS-14)				
DO, ORP, spec. cond, pH, temp	Field measured, flow-through cell	X	C	S
Permanganate	Field Colorimeter	X	C	S
VOCs	EPA Method 8260B	X		S
Dissolved metals (includes K and Mn)	EPA Methods 6010B and/or 6020	X		S
Anions (bromide, chloride, nitrate, sulfate, bicarbonate)	EPA Method 300.0 (SM 2320B for bicarbonate)	X		S
Boron	EPA Method 200.7	X		S
TDS	SM 2540C	X		S

NOTES: (1) Sampling frequency above is the minimum monitoring required; additional monitoring may be conducted as needed.
 (2) If some ports in the primary multi-port monitoring wells do not show response from the ISCO test after 3-4 months of weekly/monthly monitoring, then the frequency may be reduced (from weekly to bi-weekly for field parameter measurements, and from monthly to bi-monthly for the laboratory analytical parameters) – pending Regional Board's approval. If there is no response from some ports after 6 months of monitoring, then the sampling frequency may be further reduced from bi-weekly to monthly for field parameter measurements, and from bi-monthly to quarterly for the laboratory analytical parameters – pending Regional Board's approval.
 (3) The quarterly samples from the secondary wells shall be collected at baseline, 3, 6, and 9 months during injection, and at 3 and 6 months post-injection (6 events). The semi-annual samples from the tertiary wells shall be collected at baseline, 6 months after the start of injection, and 6 months after the stop of injection (3 events). The frequency of sampling may be increased to quarterly (for the tertiary wells) or bi-monthly or monthly (for the secondary wells) if there are influences from the ISCO injection based on the laboratory analytical data.
 (4) Baseline sampling consists of a single sampling event about one month prior to the start of injection.
 (5) Post-injection sampling shall consist of a maximum of 6 months after the final ISCO injection event, or until the Regional Board is notified that the respective pilot test for permanganate is complete.
 * Weekly sampling for field parameters (DO, ORP, specific conductivity, pH, temperature, and permanganate/color) will be conducted throughout the monitoring period unless a reduction in frequency is approved by the Regional Board, per Note (2) above. Weekly monitoring for VOCs in the primary wells will be conducted for the first 8 weeks (2 months) to allow more frequent evaluation of contaminant concentrations; after the 8 week period, monthly monitoring for VOCs will be conducted for the remaining portion of the monitoring period.
 X Test for parameter
 C Testing is contingent and shall only be conducted if there are influences from the ISCO injection in the nearest primary well (RD-31 sampling contingent on C-1 results; RD-35C contingent on RD-35B results; RD-37 contingent on C-10 and RD-106 results; RD-72 contingent on RD-106 results; HAR-24 and HAR-25 contingent on RD-73 results, and; WS-14 contingent on C-10 results).

All groundwater monitoring reports must include, at minimum, the following:

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification;
- c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

IV. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted

to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

V. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the ____ day of _____ at _____

_____ (Signature)

_____ (Title)"

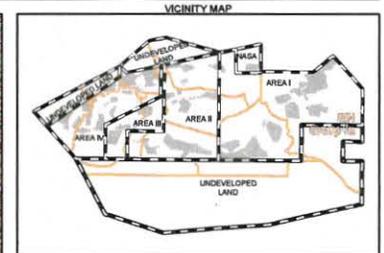
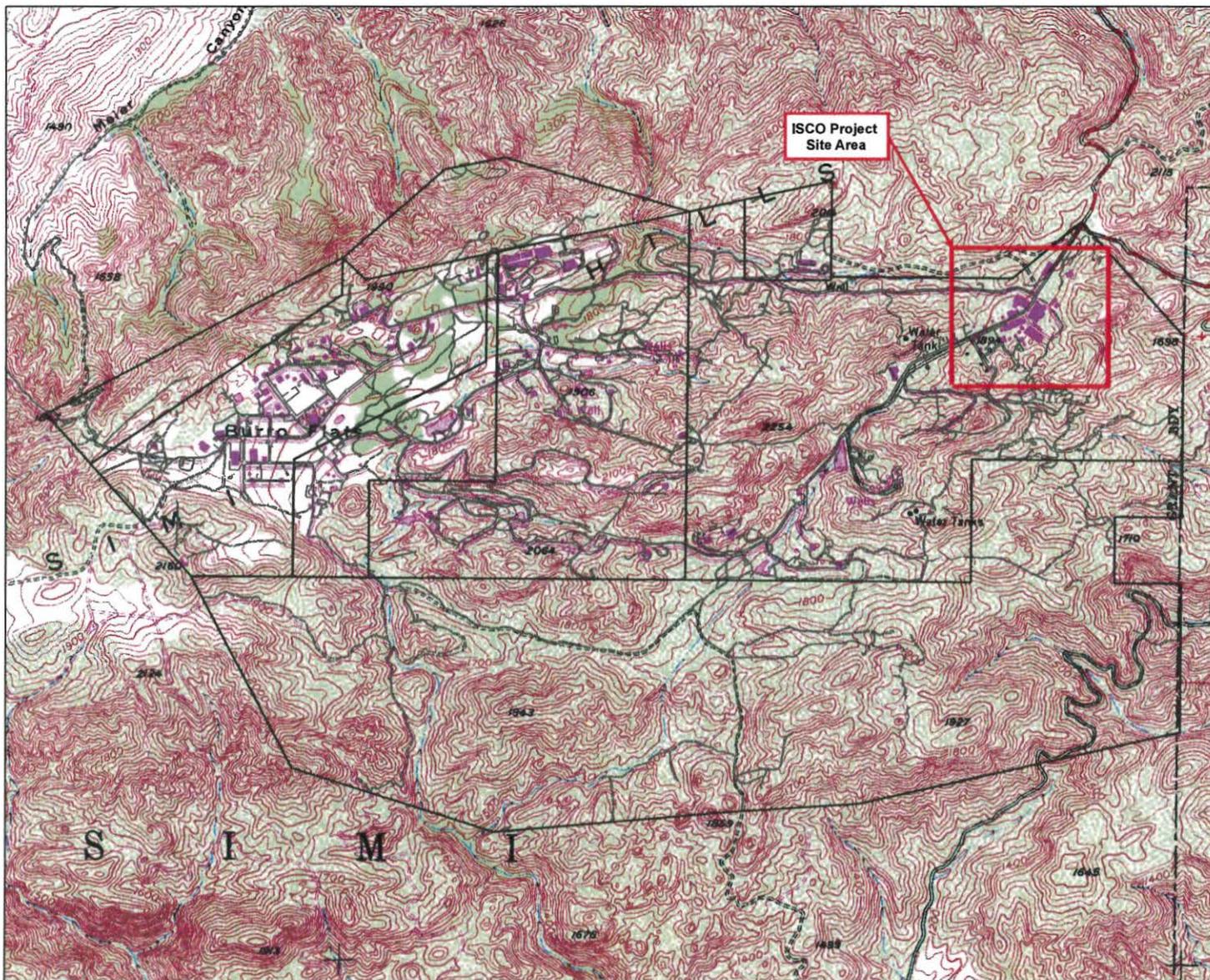
VI. ELECTRONIC SUBMITTAL OF INFORMATION (ESI) TO GEOTRACKER

The Discharger shall comply with the Electronic Submittal of information (ESI) requirements by submitting all reports required under the MRP, including groundwater monitoring data, discharge location data, correspondence, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100009654.

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by: Samuel Unger
Samuel Unger, P.E.
Executive Officer

Date: September 5, 2013



LEGEND
 --- Dirt Road
 --- Paved Road
 □ Administrative Area

Reference: USGS Topographic 7.5 Minute
 Quadrangle: Calabasas, 1967, Contour Interval: 25 ft

**WORKING
 DRAFT**

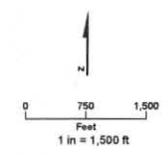


FIGURE 1
Topographic Map with
Project Site Location
 Santa Susana Field Laboratory, Ventura County, California

