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# California Regional Water Quality Control Board Central Valley Region

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Edmund G. Brown Jr.  
Governor

2 February 2011

Mr. Conrad Lewis  
State of California – Real Estate Service's Division  
707 3<sup>rd</sup> Street, 4<sup>th</sup> Floor  
West Sacramento, CA 95605

## **NOTICE OF APPLICABILITY OF GENERAL ORDER NO. R5-2008-0149 – State of California – Real Estate Service's Division, and URS Corporation, Folsom Prison, 100 Prison Road, Represa, In-Situ Remediation of Petroleum Hydrocarbons, Sacramento County**

The Responsible Party (RP), the State of California – Real Estate Service's Division (State of CA), and the project operator, URS Corporation (URS), (collectively Dischargers) submitted a Notice of Intent (NOI), dated 2 August 2010 requesting coverage under General Order No. R5-2008-0149, General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-Volatile Compounds and/or Petroleum Compounds (General Order). Subsequently supplemental information was submitted on 3 September 2010, 9 September 2010, 18 October 2010, and 7 December 2010. Based on information in these submittals, it is our determination that this project meets the required conditions to operate under Order No. 2008-0149. All of the requirements contained in the General Order are applicable to your project. You are assigned Order No. R5-2008-0149-025.

### **Project Location:**

The project is in the City of Represa in Sacramento County, Assessor's Parcel No. 071-0010-021-0000.

### **Project Description:**

Former operations of an underground tanks system at the Folsom Prison Maintenance Fueling Area in Represa, in Sacramento County caused pollution of the soil and groundwater. The primary pollutants of concern are petroleum hydrocarbon compounds, including total petroleum hydrocarbons as gasoline (TPH-G), total petroleum hydrocarbons as diesel (TPH-D), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tert butyl ether (MTBE). The site is currently occupied by the Folsom Prison Maintenance fueling Area. After more than 5 years of monitored natural attenuation, groundwater pollution remains at unacceptable levels.

Bench scale testing was conducted to determine if injection of RegenOx™ and ORC-A® could be effectively applied to the groundwater to destroy hydrocarbons without causing deleterious

**California Environmental Protection Agency**

Folsom Prison Maintenance Fueling Area  
100 Prison Road  
Represa, Sacramento County

effects (i.e. metals mobilization). Results of bench scale testing showed that TPH-G and BTEX could be degraded by RegenOx™ and ORC-A®.

For this project, the Discharger submitted the following documents:

- *Corrective Action Plan (CAP)* dated 13 September 2007.
- *Report for the Drilling and Installation of Three Groundwater Monitoring Wells, Two Injection Wells and the Results of RegenOx and ORC Bench-Scale Test for Removal of Petroleum Hydrocarbons* (Bench Test Report) dated 6 January 2010.
- *Work Plan for the RegenOx™ and ORC®* (Work Plan) dated 30 July 2010.
- *Notice of Intent (NOI)* dated 2 August 2010.
- *Third Quarter 2010 Groundwater Monitoring Report* (3Q2010 Report) dated 14 October 2010.
- Supplemental NOI information, submitted 3 September 2010, 9 September 2010, 18 October 2010, and 7 December 2010.

The NOI and CAP call for injection of a combination Chemical Oxidizer/Biodegradation compound, RegenOx™ and ORC-A®, into the groundwater at three locations during two injection events a week apart. During the first injection event, 300 pounds of RegenOx™ part B, mixed with 1,163 gallons of water, and 600 pounds of RegenOx™ part A, mixed with 2,325 gallons of water, will be injected into the three wells. Each well will be flushed with 50 to 100 gallons of water after each injection. The second injection event will use 180 pounds of RegenOx™ Part B, mixed with 700 gallons of water, followed by 660 pounds of RegenOx™ Part A, mixed with 2,557 gallons of water, and 200 pounds of ORC-A®. Each well will be flushed with 50 to 100 gallons of water between injections. Not including flushing water, approximately 6,750 gallons of water will be injected with the Reagents.

The Reagent/water will be gravity feed or pumped into each well, depending on the well's capacity to accept the material. Material will be fed to the wells as fast as the wells can accept it; pumping rates will not exceed a flow rate that creates more than 50 pounds per square inch of pressure.

No additional groundwater monitoring wells are needed or anticipated at this time. It is estimated that the project will last approximately 1 year. The Dischargers will also be conducting groundwater sampling, and reporting of the results as described in the attached Groundwater Monitoring and Reporting Program.

The contingency plan is as follows:

1. If arsenic or hexavalent chromium concentrations in wells MW-5 and MW-6 increase by greater than 20% compared to baseline concentrations, the sampling frequency will be increased to monthly in the affected well(s) and in the background well (MW-3).
2. If arsenic or hexavalent chromium concentrations have not also increased in the background well MW-3 and concentrations in MW-5 and/or MW-6 do not decrease after two consecutive monthly sampling events, batch extraction of groundwater from the impacted well(s) will be implemented until concentrations reduce to less than 20% of baseline.

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3. If other inorganic constituent concentrations (Suite B except arsenic and hexavalent chromium, in Monitoring and Reporting Program, Order No. R5-2008-0149-025) in wells MW-5 and MW-6 increase by greater than 20% compared to baseline concentrations, the sampling frequency will be increased to quarterly in the affected well(s) and in the background well (MW-3).
4. If other inorganic constituent concentrations (Suite B except arsenic and hexavalent chromium, in Monitoring and Reporting Program, Order No. R5-2008-0149-025) have not also increased in the background well MW-3 and concentrations in MW-5 and/or MW-6 do not decrease after two consecutive quarterly sampling events, batch extraction of groundwater from the impacted well(s) will be implemented until concentrations reduce to less than 20% of baseline.

If the Discharger desires to modify the injectants and/or volume of injectants, a revised Notice of Intent must be submitted and a new Notice of Applicability prepared prior to proceeding with the additional/modified injection.

The scope of work for this project falls under the CEQA documentation for the General Order. Additional CEQA activities are not needed.

No comments were received on the draft Notice of Applicability and Monitoring and Reporting Program during the 30-day public comment period ending 20 January 2011.

**General Information:**

1. The project will be operated in accordance with the requirements contained in the General Order and in accordance with the information submitted in the Notice of Intent.
2. The required annual fee (as specified in the annual billing you will receive from the State Water Resources Control Board) shall be submitted until this Notice of Applicability is officially revoked.
3. The Discharger shall comply with the attached General Order No. R5-2008-0149, General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-Volatile Compounds and/or Petroleum Compounds
4. Injection of materials other than RegenOx™ and ORC-A®, into the subsurface is prohibited, unless analysis, as specified in Order No. R5-2008-0149, of the injectant is provided and approval is given by Board staff.
5. Failure to abide by the conditions of the General Order could result in an enforcement action as authorized by provisions of the California Water Code.

Folsom Prison Maintenance Fueling Area  
100 Prison Road  
Represa, Sacramento County

6. The project will implement the final contingency plan included as part of the Notice of Intent within 30-days of it being triggered.
7. The Discharger shall comply with the attached Monitoring and Reporting Program, Order No. R5-2008-0149-025, and any revisions thereto as ordered by the Executive Officer.

If you have any questions regarding this matter, please call Vera Fischer at (916) 464-4792 or contact her at [vfischer@waterboards.ca.gov](mailto:vfischer@waterboards.ca.gov).

*original signed by Frederick Moss for*

PAMELA C. CREEDON  
Executive Officer

Attachment: General Order No. R5-2008-0149-025

cc: Della Kramer, Regional Water Quality Control Board, Sacramento  
Jack Bellan, Sacramento County Environmental Management, Sacramento  
Vernon Elarth, URS Corporation, Sacramento  
Adam Wolfe, Department of Corrections  
Joe Franz, Folsom Prison

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2008-0149-025

FOR  
IN-SITU GROUNDWATER REMEDIATION AT SITES WITH VOLATILE ORGANIC  
COMPOUNDS, NITROGEN COMPOUNDS, PERCHLORATE, PESTICIDES,  
SEMI-VOLATILE COMPOUNDS AND/OR PETROLEUM HYDROCARBONS

FOLSOM PRISON MAINTANANCE FUELING AREA  
100 PRISON ROAD, REPRESA  
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater extraction and/or treatment system. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, Regional Board staff shall approve specific sample station locations prior to implementation of sampling activities.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

### GROUNDWATER MONITORING

- As shown on Figure 1, there are 6 monitor wells associated with the site. The groundwater monitoring program for these wells and any treatment system wells installed subsequent to the issuance of this MRP, shall follow the schedule below. Monitoring wells with free phase petroleum product or visible sheen shall be monitored, at a minimum, for product thickness and depth to water. The volume of extracted groundwater, if applicable, shall also be provided in quarterly monitoring reports. Sample collection and analysis shall follow standard EPA protocol.
- The monitor wells, extraction wells and/or injection wells shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as follows:

**Table 1: Sampling Frequency and Constituent Suite**

Well Number <sup>1</sup>	Frequency <sup>2</sup>	Constituent Suite(s) <sup>3</sup>	Monitoring Objective
MW-5	Semi-Annually	Suite A	Compliance <sup>4</sup>
MW-6	Annually	Suite A, Suite B, Suite C	
MW-2	Monthly	Suite A, Suite B, Suite C	Treatment Zone <sup>5</sup>
	Quarterly	Suite A	
	Annually	Suite A, Suite B, Suite C	
MW-4	Quarterly	Suite A, Suite B	Transition Zone <sup>6</sup>
	Annually	Suite A, Suite B, Suite C	
MW-3	Annually	Suite A, Suite B, Suite C	Background <sup>7</sup>

- <sup>1</sup> Well numbers as shown on Figure 1.
- <sup>2</sup> Monthly samples will be collected for the first 3 months after injection, followed by 2 quarterly events, and an annual event approximately one year after the initial injection.
- <sup>3</sup> Constituent suite components listed in Table 2.
- <sup>4</sup> Wells used to determine compliance with water groundwater limitations.
- <sup>5</sup> Wells sampled to evaluate remedy effectiveness inside the treatment zone.
- <sup>6</sup> Wells sampled to evaluate migration of pollutants within the transition zone.
- <sup>7</sup> Wells used to develop background concentrations.

**Table 2: Analytical Methods**

Constituent	Method <sup>1</sup>	Maximum Practical Quantitation Limit (ug/L) <sup>2</sup>
<b>Suite A</b>		
TPH-Gasoline	EPA 8260B or 8015	50
TPH-Diesel	EPA 8260B or 8015	50
BTEX	EPA 8260	0.5
Methyl Tert Butyl Ether (MTBE)	EPA 8260	0.5
Hexavalent Chromium	EPA 7199	1.0
Arsenic	EPA 6020	1.0
<b>Suite B</b>		
Metals, Total and Dissolved <sup>3</sup>	EPA 6020	Various
Anions	EPA 160.1	Various
Total Dissolved Solids	EPA 160.1	10,000
<b>Suite C</b>		
Fuel Oxygenates	EPA 8260	0.5
Tert Butyl Alcohol (TBA)	EPA 8260	5

<sup>1</sup> Or an equivalent EPA Method that achieves the same or lower Practical Quantitation Limit.

<sup>2</sup> All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as an estimated value.

<sup>3</sup> Metals include: Sodium, Vanadium, Copper, Chromium, Iron, Manganese, and Zinc.

<sup>4</sup> Anions include: Chloride, Fluoride, Nitrate, and Sulfate.

BTEX = benzene, toluene, ethylbenzene, and total xylenes

Fuel Oxygenates = di-isopropyl ether, ethyl tert butyl ether, and tert amyl methyl ether

### FIELD SAMPLING

3. In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a monitoring well or injection well is sampled. The sampling and analysis of field parameters shall be as specified in Table 3.

**Table 3: Field Sampling Requirements**

<b>Parameters</b>	<b>Units</b>	<b>Type of Sample</b>
Groundwater Elevation	Feet, Mean Sea Level	Measurement +/-0.01 ft.
Oxidation-Reduction Potential	Millivolts	Grab
Electrical Conductivity	uhmos/cm	Grab
Dissolved Oxygen	mg/L	Grab
pH	pH Units (to 0.1 units)	Grab

4. Field test instruments (such as those used to test pH and dissolved oxygen) may be used provided that:
- (a) The operator is trained in proper use and maintenance of the instruments;
  - (b) The instruments are calibrated prior to each monitoring event;
  - (c) Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
  - (d) Field calibration reports are submitted as described in item (b) of the “Reporting” section of this MRP.

**DISCHARGE MONITORING**

5. The Discharger shall monitor per injection event the discharge of water and amendments that are injected into the groundwater according to the requirements specified in Table 4. Each amendment addition shall be recorded individually, along with information regarding the time period over which the amendment was injected into the aquifer.

**Table 4: Discharge Monitoring Requirements**

<b>Parameters</b>	<b>Units</b>	<b>Type of Sample</b>
Injected Volume	pounds per day	Measured

**ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES**

6. The Discharger will collect samples from wells MW-2 through MW-6, prior to injection of amendment, to establish baseline concentrations for the constituents listed on Table 2 (see above).

**REPORTING**

7. When reporting the data, the Discharger shall arrange the information in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to illustrate clearly the compliance with this Order. In addition, the Discharger shall notify the Regional Board within 48 hours of any unscheduled shutdown of any soil vapor and/or groundwater extraction system. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall also be reported to the Regional Board.

8. As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.
9. The Discharger shall submit quarterly electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The quarterly reports shall be submitted electronically over the internet to the Geotracker database system by the 1st day of the second month following the end of each half of the year by **1st day of the second month following the end of each calendar quarter (i.e., by 1 February, 1 May, 1 August and 1 November)** until such time as the Executive Officer determines that the reports are no longer necessary.
10. Hard copies of quarterly reports shall be submitted to the Regional Board by the **1st day of the second month following the end of each calendar quarter (by 1 February, 1 May, 1 August and 1 November)**. Each quarterly report shall include the following minimum information:
  - (a) a description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected, and whether the pollutant plume(s) is delineated;
  - (b) field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;
  - (c) groundwater contour maps for all groundwater zones, if applicable;
  - (d) pollutant concentration maps for all groundwater zones, if applicable;
  - (e) a table showing well construction details such as well number, groundwater zone being monitored, coordinates (longitude and latitude), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;
  - (f) a table showing historical lateral and vertical (if applicable) flow directions and gradients;
  - (g) cumulative data tables containing the water quality analytical results and depth to groundwater;
  - (h) a copy of the laboratory analytical data report, which may be submitted in an electronic format;
  - (i) the status of any ongoing remediation, including an estimate of the cumulative mass of pollutant removed from the subsurface, system operating time, the effectiveness of the remediation system, and any field notes pertaining to the operation and maintenance of the system; and



- (j) if applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions.

11. An Annual Report shall be submitted to the Regional Board by **1 February** of each year. This report shall contain an evaluation of the effectiveness and progress of the investigation and remediation, and may be substituted for the fourth quarterly monitoring report. The Annual Report shall contain the following minimum information:

- (a) both tabular and graphical summaries of all data obtained during the year;
- (b) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year;
- (c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
- (d) an analysis of whether the pollutant plume is being effectively treated;
- (e) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation system effectiveness;
- (f) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- (g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

12. A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: original signed by Frederick Moss for  
PAMELA C. CREEDON, Executive Officer

2 February 2011  
(Date)

