

ATTACHMENT C

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0012-XXX

FOR
IN-SITU GROUNDWATER REMEDIATION
AND DISCHARGE OF TREATED GROUNDWATER TO LAND
FOR
STALLWORTH AUTO SALES
602 NORTH CALIFORNIA STREET, STOCKTON
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater remediation system for the Stallworth Auto Sales at 602 North California Street in Stockton, San Joaquin County. This MRP is issued pursuant to Water Code Section 13267. Stallworth Auto Sales (The Discharger) shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, Central Valley Regional Water Quality Control Board (Central Valley Water 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 the material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

GROUNDWATER MONITORING

1. As shown on Figure 1, there are 14 groundwater monitoring wells (MW-1A, MW-1B, MW-1C, MW-1D, and MW-2 through MW-11), four (4) soil vapor extraction wells (VW-1 through VW-4), and nine (9) groundwater injection wells (IW-1 through IW-9) associated with this 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.
2. The monitoring 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 Number¹	Constituent Suite(s)³	Frequency²	Monitoring Objective
MW-6, MW-7, IW-9	Suite A, Suite B	Once within 6 months of treatment, Semi-Annually thereafter	Compliance ⁴

Table 1: Sampling Frequency and Constituent Suite (cont.)

Well Number ¹	Constituent Suite(s) ³	Frequency ²	Monitoring Objective
IW-6, IW-8	Suite A, Suite B	Once within 6 months of treatment, Semi-Annually thereafter	Transition Zone ⁵
IW-4, MW-8	Suite A, Suite B	Quarterly	Treatment Zone ⁶
MW-2	Suite A, Suite B	Semi-Annually	Background ⁷
MW-1B, MW-3, MW-4, MW-5, MW-9, MW-10, MW-11	Suite A	Semi-Annually	Other ⁸

¹ Well numbers as shown on Figure 1.

² Prior to startup and stated frequency thereafter.

³ Constituent suite components listed in Table 2.

⁴ Wells used to determine compliance with groundwater limitations.

⁵ Wells sampled to evaluate compliance with groundwater limitations.

⁶ Wells sampled to evaluate progress inside the treatment zone.

⁷ Wells used to evaluate background concentrations.

⁸ Wells used to define the extent of groundwater impacts.

Table 2: Analytical Methods

Constituent	Method ¹	Maximum Practical Quantitation Limit (µg/L) ²
Suite A		
TPH-G and TPH-D ³	EPA 8260B or 8015	50
BTEX ⁴	EPA 8260B	0.5
Fuel Oxygenates ⁵	EPA 8260B	0.5 - 5
1,2-Dichloroethane (1,2-DCA), ethylene dibromide (EDB)	EPA 8260B	0.5
Suite B		
Metals, Dissolved ⁶	EPA 6010 or 6020	Various
Hexavalent Chromium	EPA 7199	1.0
Total Dissolved Solids	EPA SM250C	10
Bromate and Bromide	EPA 300.1	1000

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

² All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as trace.

³ TPH-G = total petroleum hydrocarbons as gasoline, TPH-D = total petroleum hydrocarbons as diesel

⁴ BTEX = benzene, toluene, ethylbenzene, and total xylenes

⁵ Fuel Oxygenates = methyl tert butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tert butyl ether (ETBE), tert amyl methyl ether (TAME), and tert butyl alcohol (TBA)

⁶ Metals include: Aluminum, Arsenic, Barium, Calcium, total Chromium, Copper, Iron, Manganese, and Zinc.

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

Parameters	Units	Practical Quantitation Limit	Analytical Method
Groundwater Elevation	Feet, Mean Sea Level	0.01 feet	Measurement +/- 0.01 ft.
Oxidation-Reduction Potential	Millivolts	10 millivolts	Field Meter
Electrical Conductivity	uhmos/cm	50 μ S/cm ²	Field Meter
Dissolved Oxygen	mg/L	0.2 mg/L	Field Meter
pH	pH Units (to 0.1 units)	0.1 units	Field Meter
Temperature	^o F/ ^o C	0.1 ^o F/ ^o C	Field Meter

All wells that are purged shall be purged until pH, temperature, conductivity and dissolved oxygen are within 10% of the previous value.

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.

IN-SITU DISCHARGE MONITORING

5. The Discharger shall monitor during the injection event the discharge of hydrogen peroxide that is 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 subsurface.

Table 4: Discharge Monitoring Requirements

Parameters	Units	Type of Sample
Injected Volume	pounds of injectant per day	Pounds per day specified by manufacturer, operational uptime measure with hour meter

ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES

6. The Discharger established the following background values for concentrations in shallow groundwater (about 56 to 68.5 feet below ground surface) in Table 5A and deep groundwater (about 116-121 feet below ground surface) in Table 5B.

Table 5A: Shallow Background Concentration Values

Constituent	Background Concentration (µg/L)
Arsenic	116
Barium	1,320
Bromide	1,100
Bromate	<13
Cadmium	<5
Copper	90
Hexavalent Chromium	<0.20
Iron	2,750
Manganese	4,760
Total Dissolved Solids	565,000
Electrical Conductivity	1198 µmhos/cm

Table 5B: Deep Background Concentration Values

Constituent	Background Concentration (µg/L)
Arsenic	108
Barium	1,190
Bromide	640
Bromate	<13
Cadmium	<5
Copper	83
Hexavalent Chromium	<0.20
Iron	740
Manganese	2,080
Total Dissolved Solids	560,000
Electrical Conductivity	1121 µmhos/cm

a –Maximum detected concentrations, sampled collected October 2016 from treatment, background, transition, and compliance zone wells

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 Central Valley Water Board within 48 hours of any changes in scheduled injection and/or monitoring events. 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 Central Valley Water 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 **30th day of the month following the end of each calendar quarter (each 30 April, 30 July, 30 October, and 30 January)** until such time as the Executive Officer determines that the reports are no longer necessary. 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.
 - (d) Pollutant concentration maps for all groundwater zones.
 - (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 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, the effectiveness of the remediation system, and any field notes pertaining to the injection and monitoring of the remedial action.
 - (j) The reasons for and duration of all interruptions in the operation of the remediation project, and actions planned or taken to correct and prevent interruptions.
10. An Annual Report shall be submitted to the State Water Resources Control Board Geotracker database by **30 January** 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 quarter 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 network or reporting program.
 - (g) A proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.
11. 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:

Pamela C. Creedon, Executive Officer

(Date)