CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0012-014

FOR
IN-SITU GROUNDWATER REMEDIATION AND DISCHARGE OF
TREATED GROUNDWATER TO LAND
FOR
FORMER BARNES TRUCKING FACILITY
1817 SOUTH FRESNO AVENUE, STOCKTON
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring an in-situ groundwater remediation system for the former Barnes Trucking Facility at 1817 South Fresno Avenue, Stockton, California (Site). 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, California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff shall approve specific sample 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 sample shall be recorded on the sample chain of custody form.

GROUNDWATER MONITORING

1. As shown on Figure 1, there are 25 existing wells, 11 groundwater monitoring wells, 12 remediation wells formerly used for oxygen injection by iSOC, re-purposed for groundwater monitoring, and 1 existing air sparge and 1 dual phase extraction well, 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 groundwater monitoring 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[1]	Constituent[2]	Frequency[3]	Monitoring Objective
MW-6, MW-7, MW-8	Suites A and B	Monthly for the first three months of injection, there after Semi-Annually	Compliance Zone[4]
AS-1, MW-9, IW-10	Suites A and B	Monthly for the first three months of injection, there after Semi-Annually	Treatment Zone[5]
MW-10, MW-11, IW-2, IW-6, IW-8	Suites A and B	Monthly for the first three months of injection, there after Semi-Annually	Transition Zone[6]
MW-2	Suites A and B	Semi-annually	Background[7]

[1] Well numbers as shown on Figure 1.
[2] Constituent analytical methods are listed in Table 2.
[3] i.e., weekly, monthly, quarterly, semi-annually, annually, other. Semi-annual sampling occurs 1st and 3rd quarters.
[4] Wells used to determine compliance with water groundwater action levels.
[5] Wells sampled to evaluate in-situ bioremediation progress and inside the treatment zone.
[6] Wells sampled to evaluate migration of pollutants and byproducts within the transition zone.
[7] Wells used to develop naturally occurring, background concentrations.[2]

Table 2: Analytical Methods

Constituent	Method[1]	Maximum Practical Quantitation Limit (µg/L)[2]
Suite A		
Total Petroleum Hydrocarbons as Gasoline (TPH-G)	EPA 8015/8260	50
Benzene, Toluene, Ethylbenzene, total Xylenes	EPA 8260B	0.50
Suite B		
Metals, dissolved[3]	EPA 200.8	4.0 to 10.0
Hexavalent Chromium	APHA/EPA 7199 Methods	1.0
Bromide	EPA 300.0	250
Bromate	UV/VIS	1.0

[1] Or an equivalent EPA Method that achieves the maximum Practical Quantitation Limit.
[2] All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as trace.
[3] Metals include arsenic, barium, cadmium, calcium, total chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel, and silica. Practical Quantitation Limit must be below Action Levels for appropriate comparison.

FIELD SAMPLING

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

Table 3: Field Sampling Requirements

Parameters	Units	Practical Quantitation Limit	Type of Sample
Groundwater Elevation	Feet, Mean Sea Level	0.01 feet	Measurement
Oxidation Reduction Potential	millivolts	10 millivolts	Grab
Electrical Conductivity	uhmos/cm	50 µS/cm[2]	Grab

Parameters	Units	Practical Quantitation Limit	Type of Sample
Dissolved Oxygen	mg/L	0.2 mg/L	Down hole
pH	pH Units (to 0.1 units)	0.1 units	Grab
Water Temperature	Degrees Celsius	0.1 °F/°C	Grab

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

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.
d. Field calibration reports are submitted as described in item (b) of the "Reporting" section of this MRP.

4. An ozone detection meter (field test instrument) will be continuously monitoring the breathing zones inside the remediation equipment area and at each injection wellhead during maintenance and monitoring field activities.

IN-SITU DISCHARGE MONITORING

5. The Discharger shall monitor the 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. Periods when the ozone treatment system is inoperative shall be noted with dates and times in the monitoring report.

Table 4: Discharge Monitoring Requirements

Parameter	Units	Type of Sample
Ozone	pounds per day	Pounds per day specified by manufacturer, operational uptime measured with hour meter

REPORTING

6. 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.

7. 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.

8. 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, **30 April, 30 July, 30 October, and 30 January,** until such time as site conditions and Regional Board staff determine that modification to the reporting requirements are applicable.

9. 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) Cumulative data tables containing the water quality analytical results and depth to groundwater.

   f) A copy of the laboratory analytical data report, which may be submitted in an electronic format.

   g) 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.

   h) 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.

   i) Tabular and graphical summaries of all data obtained during the year.

   j) Groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year.

   k) A discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells.

   l) An analysis of whether the pollutant plume is being effectively treated.

   m) 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.

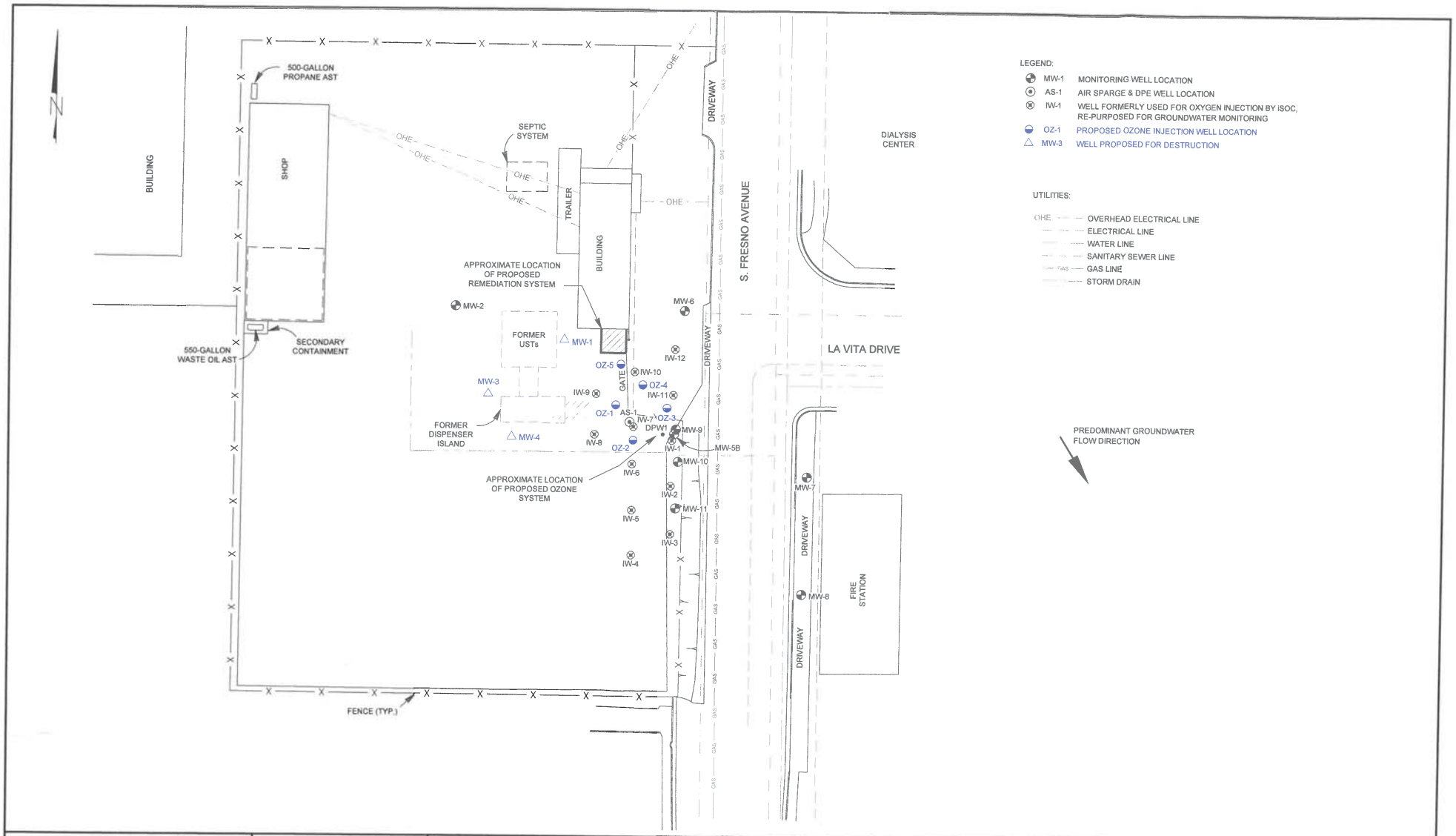
   n) An identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

o) A proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes, if needed.

10. 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: Andrew Altevogt For
PAMELA C. CREEDON
Executive Officer
2/17/16
(Date)



STRATUS ENVIRONMENTAL, INC.

PATH NAME: Barnes Trucking\Workplan
DRAFTER INITIALS: DMG
DATE LAST REVISED: December 14, 2015
FILENAME: Barnes NSiteplan

0 50 FT
SCALE

BARNES TRUCKING FACILITY
1817 SOUTH FRESNO AVENUE
STOCKTON, CALIFORNIA

SITE PLAN DEPICTING PROPOSED OZONE INJECTION WELL LOCATIONS

FIGURE
1

PROJECT NO.
2154-1817-01