California Regional Water Quality Control Board
Central Valley Region
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Matthew Rodriquez
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Edmund G. Brown Jr.
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25 November 2014

James Costigan, Jr.
Trustee for Arthur A. Labour Estate
4149 Burnett Road
Lincoln, CA 95648

Christine Parent
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

REVISED NOTICE OF APPLICABILITY OF GENERAL ORDER NO. R5-2008-0149 –038, JAMES COSTIGAN, JR. (TRUSTEE FOR ARTHUR A. LABOUR ESTATE) AND DEPARTMENT OF TOXIC SUBSTANCES CONTROL, FORMER SACRAMENTO PLATING SITE, 2809 AND 2815 S STREET, SACRAMENTO, IN-SITU REMEDIATION OF VOLATILE ORGANICS AND HEXAVALENT CHROMIUM, SACRAMENTO COUNTY

The Department of Toxic Substances Control and James Costigan, Jr. (trustee for Arthur A. Labour Trust) submitted a Notice of Intent, dated 15 November 2011, requesting revision to their Notice of Applicability for the Sacramento Plating Shop, Order No. R5-2008-0149-038, 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. Based on information in your submittal, it is our determination that this project meets the required conditions to be approved under Order No. 2008-0149. All of the requirements contained in the general order are applicable to your project. Your order number, Order No. R5-2008-0149-038, remains unchanged as this is a minor revision of that Order.

Project Location:

The project is in the City of Sacramento in Sacramento County,
Section 4, T8N, R1W MDB&M.
Assessor's Parcel Nos. 010-0053-009-0000 and 010-0053-008-0000.

Project Description:

Past operations at the Former Sacramento Plating Site at 2809 and 2815 S Street in Sacramento (See Figure 1) caused pollution of the soil and groundwater. The principal pollutants of concern in groundwater are trichloroethene (TCE), it's breakdown products – cis-1,2-dichloroethene and vinyl chloride, and hexavalent chromium. The facility was in operation from 1949 to 1990 providing chrome stripping, bumper grinding and rebuilding and nickel, chrome, copper and brass plating services. The facility was demolished in 1996 and the debris hauled away. In 1998 contaminated soils and concrete was excavated and disposed of. Groundwater was found to contain TCE and hexavalent chromium above drinking water

standards (MCLs). The MCL for TCE is 5.0 micrograms per liter (µg/L) and the Public Health Goal is 1.7 µg/L. There is an MCL for hexavalent chromium of 10 µg/L and a Public Health Goal of 0.02 µg/L. In addition there is an MCL for total chromium of 50 µg/L. Several bench scale tests were conducted to determine if in-situ reduction of TCE and immobilization of hexavalent chromium was a viable groundwater remedial option. The results of the bench tests were mixed, but it appeared that in-situ reduction of TCE and hexavalent chromium was possible at the site.

In June 2012 a pilot test was commenced under Order No. R5-2008-0149-038. The pilot test consisted of injecting a total of 1250 pounds of EHC in 1260 gallons of water into three injection points. The goal of the pilot study was to attempt to reduce TCE to ethene and hexavalent chromium to trivalent chromium which will then precipitate out in a very low soluble chrome hydroxide. This pilot study was conducted in an area of high concentrations of the two pollutants on-site and monitoring of the process was conducted. The results showed a 95% reduction of hexavalent chromium 15 feet downgradient of the injection points and 38% reduction 60 feet downgradient. Little change was noted in the TCE concentrations.

The new project under this Notice of Applicability is designed to reduce concentrations of hexavalent chromium and TCE farther downgradient. The project will inject a total of 3360 pounds of liquid EHC, and a bacterial consortium, 20 to 29 feet below ground surface into four injection points. The bacterial consortium is to enhance the reduction of TCE, which did not occur in the pilot test.

No comments were received on the draft Notice of Applicability and Monitoring and Reporting Program during the 30-day public comment period ending 21 November 2014.

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, including the Phase 2 Pilot-Scale Treatability Study Work Plan (22 August 2014).

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. Injection of materials other than a solution of EHC-L^{TM}, ferrous iron gluconate, SDC-9 (bacteria consortium) and water into the subsurface is prohibited.

4. 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.

5. The project will implement the final contingency plan included as part of the Notice of Intent within 30-days of it being triggered.

6. The Discharger shall comply with the attached Monitoring and Reporting Program, Order No. R5-2008-0149-038, and any revisions thereto as ordered by the Executive Officer.

If you have any questions regarding this matter, please call Alexander MacDonald at (916) 464-4625 or contact him at amacdonald@waterboards.ca.gov.

Original signed by:

PAMELA C. CREEDON
Executive Officer

Attachments

cc: Della Kramer, Regional Water Quality Control Board, Sacramento
Chris Parent, Department of Toxic Substances Control, Sacramento
Scott Lookingbill, URS Corporation, Sacramento

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. R5-2008-0149-038

FOR
JAMES COSTIGAN, JR. (TRUSTEE FOR ARTHUR A. LABOUR ESTATE) AND
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
FORMER SACRAMENTO PLATING SITE
2809 AND 2815 S STREET, SACRAMENTO
IN-SITU REMEDIATION OF VOLATILE ORGANICS AND HEXAVALENT CHROMIUM
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater extraction and 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 9 monitor wells associated with this site, not all of which will be monitored under this program. 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. Monitor 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[1]	Frequency[2]	Constituent Suite(s)[3]	Monitoring Objective
MW-01	Every 6 months	Groundwater Elevation, Field Parameters, Suite A and Suite B	Background
MW-02	Prior to Startup[6] only	Groundwater Elevation and Field Parameters, Dissolved Metals, Hexavalent Chromium, VOCs	Background
MW-03	1 month, 3 months, 6 months, 1 year, then 2x year	Groundwater Elevation, Field Parameters, Suite A and Suite B	Treatment Zone
MW-04, MW-05, MW-06	1 month, 3 months, 6 months, 1 year, then 2x year	Groundwater Elevation Only	Background

Well Number[1]	Frequency[2]	Constituent Suite(s)[3]	Monitoring Objective
MW-07	6 months, 1 year, then 2x year	Groundwater Elevation, Field Parameters, Dissolved Metals, Hexavalent Chromium, VOCs	Compliance[4]
MW-11	1 month, 3 months, 6 months, 1 year, then 2x year	Groundwater Elevation, Field Parameters, Suite A and Suite B	Transition Zone

[1] Well numbers as shown on Figure 1.
[2] Prior to startup and stated frequency thereafter. 2xyear equals every six months.
[3] Constituent suite components listed in Table 2 and Field Parameters in Table 3.
[4] Wells used to determine compliance with water groundwater limitations.
[5] Wells sampled to evaluate progress inside the treatment zone.
[6] Except groundwater elevation monitoring which will be on the schedule of MW-04 to MW-06.

Table 2: Analytical Methods

Constituent	Method[1]	Maximum Practical Quantitation Limit (µg/L)[2]
Suite A		
Volatile Organics (VOCs)	EPA Method 8260	0.5
Hexavalent Chromium	EPA Method 7199	0.5
Dissolved Metals[3]	EPA Methods 200.7, 200.8, E370.1 and E245.2	Various
Dissolved Iron	EPA Method 200.7	100
Suite B		
Total Dissolved Solids	EPA Method 160.1	10,000
Iron, Total	EPA Method 200.7	100
Sulfate, Chloride, Nitrate, Nitrite	EPA Method 300.1	300
Total Organic Carbon	EPA Method 415	300
Ethene	RSK-SOP-175	
Methane and Carbon Dioxide[4]	EPA_RSK_175	

[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 an estimated value.
[3] Metals include arsenic, barium, cadmium, calcium, total chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel and silica.
[4] MW-03 and MW-11

FIELD SAMPLING

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

Table 3: Field Sampling Requirements

Parameters	Units	Type of Sample
Groundwater Elevation	Feet, Mean Sea Level	Measurement
Oxidation-Reduction Potential	millivolts	Grab
Electrical Conductivity	µhmos/cm	Grab
Dissolved Oxygen	mg/L	Grab
pH	pH Units (to 0.1 units)	Grab
Temperature	^{o}C	
Ferrous Iron[1]	ppm	Grab

[1] Methane will be measured only in MW-01, MW-03 and MW-11.

Field test instruments (such as those used to test pH methane and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in item (b) of the “Reporting” section of this MRP.

DISCHARGE MONITORING

The Discharger shall monitor daily 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

Parameters	Units	Type of Sample
Injected Volume	gallons per day	Meter
Amendment(s) Added	kilograms per day	Measured

AMENDMENT ANALYSIS

Amendments shall be analyzed for the constituents listed in Table 5. The analysis should be done on the pure amendment and on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the pilot project.

Table 5: Amendment Analytical Requirements

Constituent	Method[1]	Maximum Practical Quantitation Limit (µg/L)[2]
Volatile Organic Compounds	EPA 8020 or 8260B	0.5
General Minerals[3]		
Metals, Total and Dissolved[4]	EPA 200.7, 200.8	Various
Semi-Volatile Organic Compounds	EPA Method 8270	5.0
Total Dissolved Solids	EPA 160.1	10,000
pH	meter	NA
Electrical Conductivity	meter	NA

[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, and reported as an estimated value.
[3] Alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, ammonia.
[4] Metals include arsenic, barium, cadmium, calcium, total chromium, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, selenium and silica.

ESTABLISHEMENT OF BACKGROUND CONCENTRATION VALUES

The Discharger shall use the data collected during the initial sampling and additional data provided by samples from MW-04 and MW-05 to determine background concentrations of total dissolved solids, total and dissolved iron and total and dissolved manganese.

REPORTING

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.

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.

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 third month following the completion of each monitoring event** until such time as the Executive Officer determines that the reports are no longer necessary. Regional Board staff shall be notified each time a report is submitted to Geotracker.

Hard copies of over-size figures (greater than 8.5”x11”) shall be submitted to the Regional Board by the **1st day of the third month following the end of each monitoring event.**

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.

If requested, 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 quarter **(or second semi-annual)** 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.

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

22 November 2014
(Date)

10/16/2014:AMM

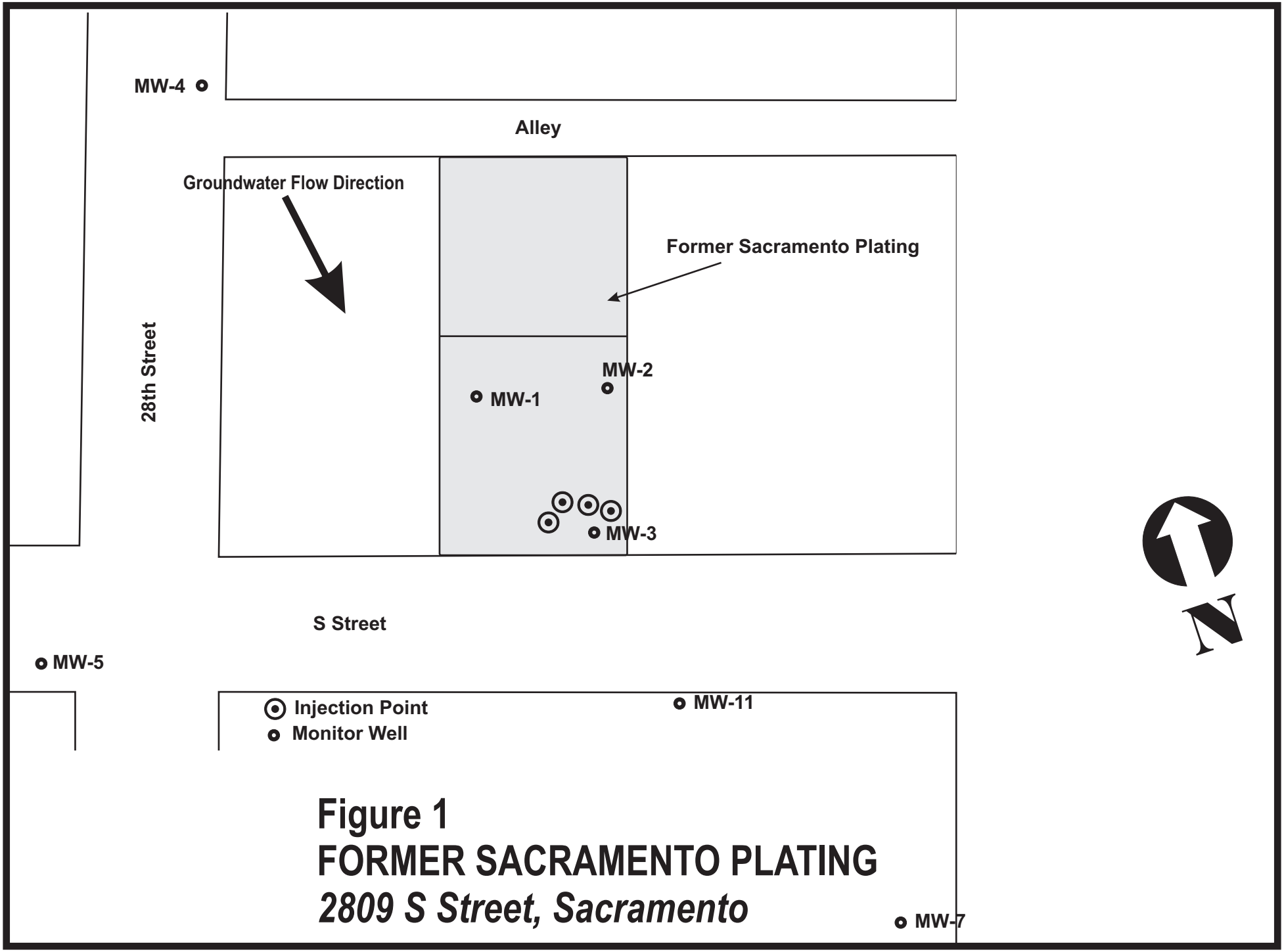

Figure 1
FORMER SACRAMENTO PLATING
2809 S Street, Sacramento