FOURTH FIVE-YEAR REVIEW REPORT FOR SELMA PRESSURE TREATING COMPANY SUPERFUND SITE

SELMA, FRESNO COUNTY, CALIFORNIA

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FOR

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Date:

September 19 2016

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Executive Summary

This is the fourth Five-Year Review (FYR) of the Selma Pressure Treating Company Site (Site) located in Selma, Fresno County, California. The purpose of this Five-Year Review is to review information to determine if the remedy is protective of human health and the environment.

The Site is approximately 18 acres in size and consists of a warehouse, groundwater treatment shed, soil impoundment, impermeable asphalt cap, two percolation ponds, and groundwater monitoring wells. An additional area of adjacent vineyards, where site drainage was directed, and where contaminated groundwater exists, extends to the southwest across Highway 99. Soil contaminated above levels that would allow for unlimited use/unrestricted exposure (UU/UE) are contained within the soil impoundment and below the asphalt cap at the Site. The soil contaminants of concern are total chromium, arsenic, copper, dioxins/furans and pentachlorophenol (PCP). Groundwater beneath the Site is contaminated with chromium, including trivalent chromium and hexavalent chromium.

In the 1988 Record of Decision (ROD), EPA selected a soil remedy consisting of excavating soil containing contaminants of concern (COCs) at concentrations that exceeded cleanup levels, treating the soils with a fixing agent, placing treated soil into excavated areas, and covering the treated soil areas with a Resource Conservation and Recovery Act (RCRA) cap. The soil remedy includes long-term monitoring of soil impoundment and access and land use restrictions for capped areas. The ROD set cleanup levels for soil COCs to prevent human exposure. In the 1993 Explanation of Significant Differences (ESD), EPA lowered the soil cleanup standard for arsenic from 50 mg/kg to 25 mg/kg and established a soil cleanup standard for PCP of 17 mg/kg. Finally, in the 2003 ROD Amendment, EPA determined that due to consistently low concentrations of arsenic, PCP, and dioxins/furans detected in groundwater, remediation of soil containing those chemicals was not required in order to protect groundwater; however, remediation of these COCs in soil was necessary to prevent direct human exposure.

In the 1988 ROD, EPA selected a groundwater remedy that would employ a conventional extraction and ex situ precipitation, coagulation, and flocculation treatment process to remove (total) chromium to meet the applicable drinking water standard, with either re-injection or offsite disposal of the treated effluent, and groundwater monitoring to verify contaminant cleanup. Four Explanations of Significant Difference (ESD) have been issued that modified or explained aspects of the groundwater remedy for the Site. In 1993, EPA issued the first ESD, which established groundwater treatment phases and allowed for a more observational approach for the siting and design of new wells. In 1997, EPA determined through a second ESD, that any concentrations of PCP in groundwater are below 1 µg/L and that (total) chromium is the primary contaminant in groundwater at the Site. EPA also determined in 1997 that discharges of the treated effluent to percolation ponds are allowed. A third ESD was issued in 2005, which added in situ bioremediation to the groundwater remedy to accelerate cleanup. This technology injects molasses amended groundwater to create a reducing environment in order to convert chromium from the mobile hexavalent form to the relatively immobile trivalent form. The fourth ESD was issued in 2013 to create an institutional control in the form of a governmental notification system when new well development is proposed on an expanded area beyond the boundaries of the Site.

EPA has implemented and completed all soil remedy components in accordance with the 1988 Record of Decision (ROD), 1993 ESD, and 2003 ROD Amendment. Engineering and Institutional Controls are in place to prevent exposure to contaminated soils. The soil remedy is functioning as intended.

Many steps have been taken to implement the remedy for groundwater at the Site. However, cleanup levels have not yet been achieved and remedial actions are ongoing. In-situ bioremediation (ISB) has operated continuously from 2009 to present. However, in 2015 groundwater levels declined below the inlet screens of all but one of the extraction wells, impeding efficient operation of the ISB groundwater treatment system.

In 2014, in response to new information about the toxicity of hexavalent chromium, the State of California established a Maximum Contamination Limit (MCL) for hexavalent chromium of 10 µg/L in public drinking water systems. The extent of the hexavalent chromium groundwater plume at the 10 µg/L level is not completely delineated and known. EPA is currently conducting an investigation to define the extent of the hexavalent chromium plume.

Private groundwater wells currently exist downgradient of the Site and within the hexavalent chromium groundwater plume. These wells are used for irrigation, residential landscaping purposes, and drinking water. EPA sampled twelve private wells within the known extent of the total chromium plume. Two domestic and four irrigation wells contained total chromium and/or hexavalent chromium at unacceptable levels. The two domestic properties are currently receiving bottled water until EPA installs onsite treatment systems. The full extent of the hexavalent chromium groundwater plume has not been defined, and there may be additional private wells with hexavalent chromium and total chromium at unacceptable concentrations.

The groundwater remedy is not fully functioning as intended due to declining groundwater levels. The multiyear drought has resulted in declining groundwater levels that are preventing full operation of extraction wells at the Site, thereby preventing effective treatment of contaminated groundwater and attainment of Site cleanup standards for groundwater. The declining groundwater has caused many monitoring wells to go dry, thus interfering with the ability to collect data about the progress of the groundwater remedy and the extent of the hexavalent groundwater plume. Furthermore, the increased demand and use for groundwater for agriculture may influence and pull the hexavalent chromium groundwater plume further away from the Site.

The soil remedy at the Selma Pressure Treating Company Superfund Site is protective of human health and the environment because there is no exposure. All areas containing contaminated soil above cleanup levels have been excavated and/or capped. Institutional controls are in place for the soil remedy that restrict the land use and use of groundwater at the Site.

A protectiveness determination of the remedy at the Selma Pressure Treating Company Superfund Site cannot be made at this time until further information is obtained. Further information will be obtained by completing the ongoing groundwater investigation to delineate the extent of Site-related groundwater contamination, identify and sample private wells within the plume and continue to provide bottled drinking water to affected resident(s), as necessary, until on-site treatment systems are installed and

operational. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made. In addition, for long-term protectiveness the following items also need to be completed:

- Extend the well development monitoring area to include the entire plume, once defined;
- Evaluate the State of California MCL for hexavalent chromium for impacted residential water supply wells and consider it in regard to the Site groundwater cleanup level.

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List of Abbreviations

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
COC	contaminant of concern
DTSC	State of California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
FFS	Focused Feasibility Study
FYR	Five-Year Review
IC	Institutional Control
IRIS	Integrated Risk Information System
ISB	in-situ bioremediation
LUC	land use control
MCL	Maximum Contaminant Level
MSL	mean sea level
NCP	National Contingency Plan
O&M	operations and maintenance
PCP	pentachlorophenol
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
TEQ	toxicity equivalency quotient
total chromium	sum of trivalent and hexavalent chromium concentrations
UU/UE	Unlimited Use and Unrestricted Exposure
USACE	U.S. Army Corps of Engineers

1. Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this Five-Year Review Report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, 40 Code of Federal Regulation (CFR) Section 300.430(f)(4)(ii) of the National Contingency Plan (NCP) and EPA policy.

This is the fourth FYR for the Selma Pressure Treating Company Superfund Site, which is a former wood treatment and storage facility. The triggering action for this statutory review is the completion date of the previous FYR (9/28/2011). The FYR has been prepared since hazardous substances, pollutants, or contaminants remain at the Site in groundwater above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Selma Pressure Treating Company Superfund Site Five-Year Review was led by Grace Ma, Remedial Project Manager, EPA, Kayla Patten, Environmental Engineer, and Jayson Osborne of the U.S. Army Corps of Engineers (USACE). The review began on 12/3/2015. A list of documents reviewed during the course of this Five-Year Review can be found in Appendix A.

Table 1. Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Selma Pressure Treating Company Superfund Site		
EPA ID: CAD029452141		
Region: 9	**State:** CA	**City/County:** Selma/Fresno County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Grace Ma		
Author affiliation: U.S. Environmental Protection Agency, Region 9		
Review period: 12/3/2015 - 9/28/2016		
Date of site inspection: 1/26/2016		
Type of review: Statutory		
Review number: 4		
Triggering action date: 9/28/2011		
Due date *(five years after triggering action date)*: 9/28/2016		

1.1. Background

Wood treatment operations began at the Site in 1936. The wood treatment process originally involved dipping wood into a mixture of pentachlorophenol (PCP) and oil, then drying the wood on open racks. In 1965, a new pressure treating facility began operating at the same site. The pressure-treating process consisted of impregnating the wood in pressurized vessels with chemical preservatives, including fluor-chromium-arsenate-phenol, and PCP. The pressure treated wood was placed on racks on the drip pad area, and then moved to the wood storage area. The operating area and wood storage area were paved with asphalt in 1982. Prior to 1982, discharge practices included: (1) runoff into drainage and percolation ditches, (2) drainage into dry wells, (3) spillage onto open ground, (4) placement into an unlined pond and a sludge pit, and (5) discharges to the adjacent vineyards. Wood treatment activities were suspended in 1994. In November 1997, all pressure vessels and tanks were removed from the Site. All buildings, except the office, were demolished and the debris removed from the Site.

1.2. Physical Characteristics

The Site is located in the Central Valley of California, approximately 15 miles south of the City of Fresno, in Selma, California (Figure 1). The original Site property occupies an area approximately 18 acres in size, which includes a paved area where the former wood treatment and storage facility operated, percolation ponds, a building housing a non-operating former water treatment facility, and a soil impoundment cell (Figure 2 and 3). The Site is zoned for industrial use, and is located between other agricultural, residential, and industrial areas. The land uses at and adjacent to the Site are not projected to change within the next five years. However, potential changes to land use of parcels adjacent to the Site are proposed under the City of Selma 2035 General Plan. Under the preferred alternative described in the City of Selma 2035 General Plan, parcels approximately ¼ mile to the south and southeast of the Site would be zoned Regional Commercial; parcels approximately ¼ mile to the southwest of the Site would be zoned for mixed use; and parcels immediately southwest of the Site across Highway 99 would be zoned for high density residential use (City of Selma, California, 2014). These areas are currently used for agricultural purposes.

At the time of this FYR, an estimated 25 residences, five industrial facilities, and a local government office are located within a quarter of a mile of the Site. Approximately four residences border the Site to the east, and approximately 21 residences are located across Highway 99 to the west of the Site. Vineyards, orchards and residences are across Highway 99 to the southwest. A recycling transfer yard lies south of the Site.

Another recycling company currently uses a portion of the asphalt cap as a recycling transfer yard. Approximately 30% of the asphalt cap is in use for recycling activity; the remainder is currently vacant. Groundwater wells located downgradient of the former wood treating facility are pumped for irrigation, residential landscaping and drinking water. The Site is not near any environmentally sensitive areas, and there are no surface water bodies affected by the Site.

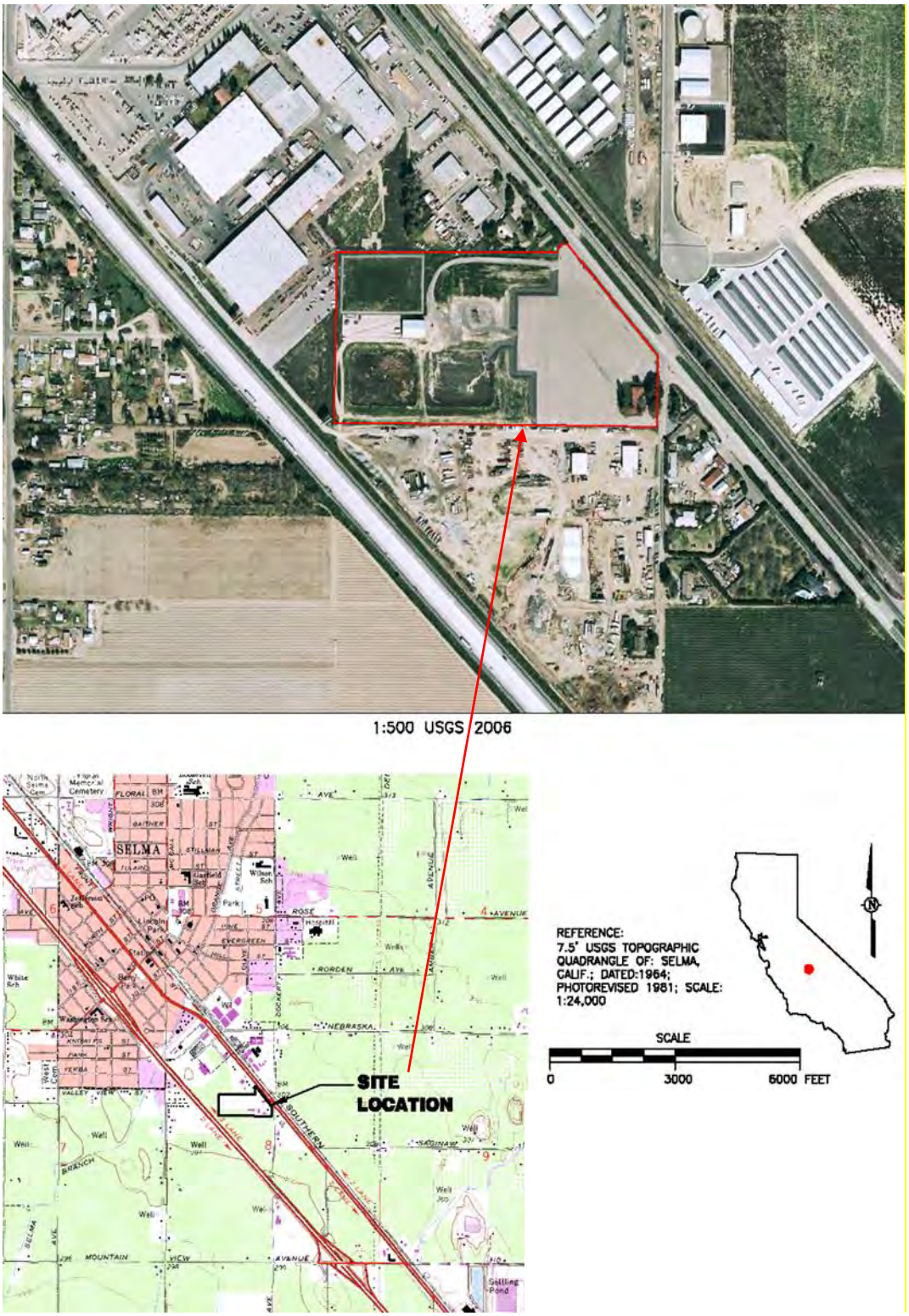


Figure 1. Site Location Map for the Selma Pressure Treating Company Superfund Site

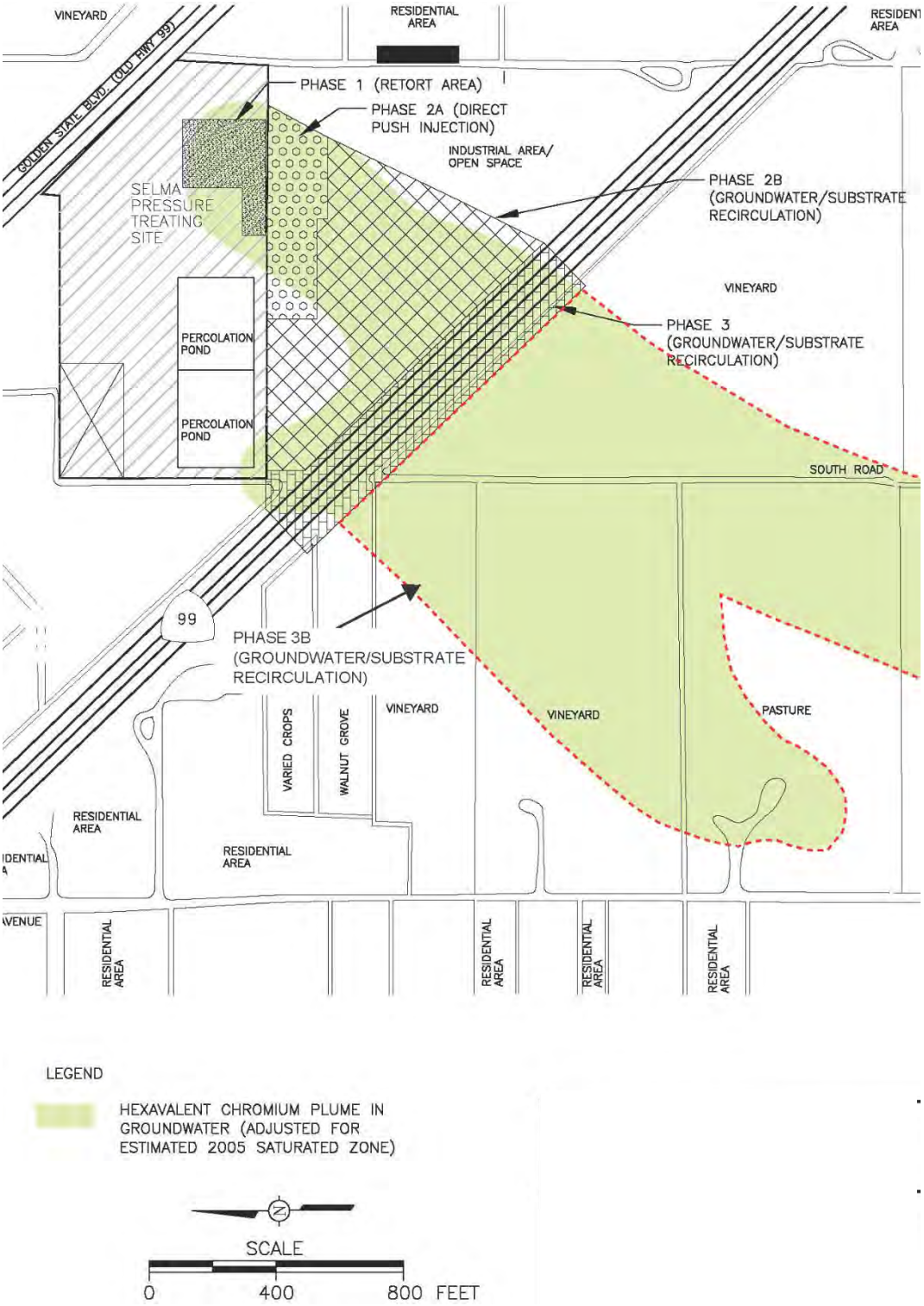


Figure 2. Site Location Map Selma Pressure Treating Company Superfund Site

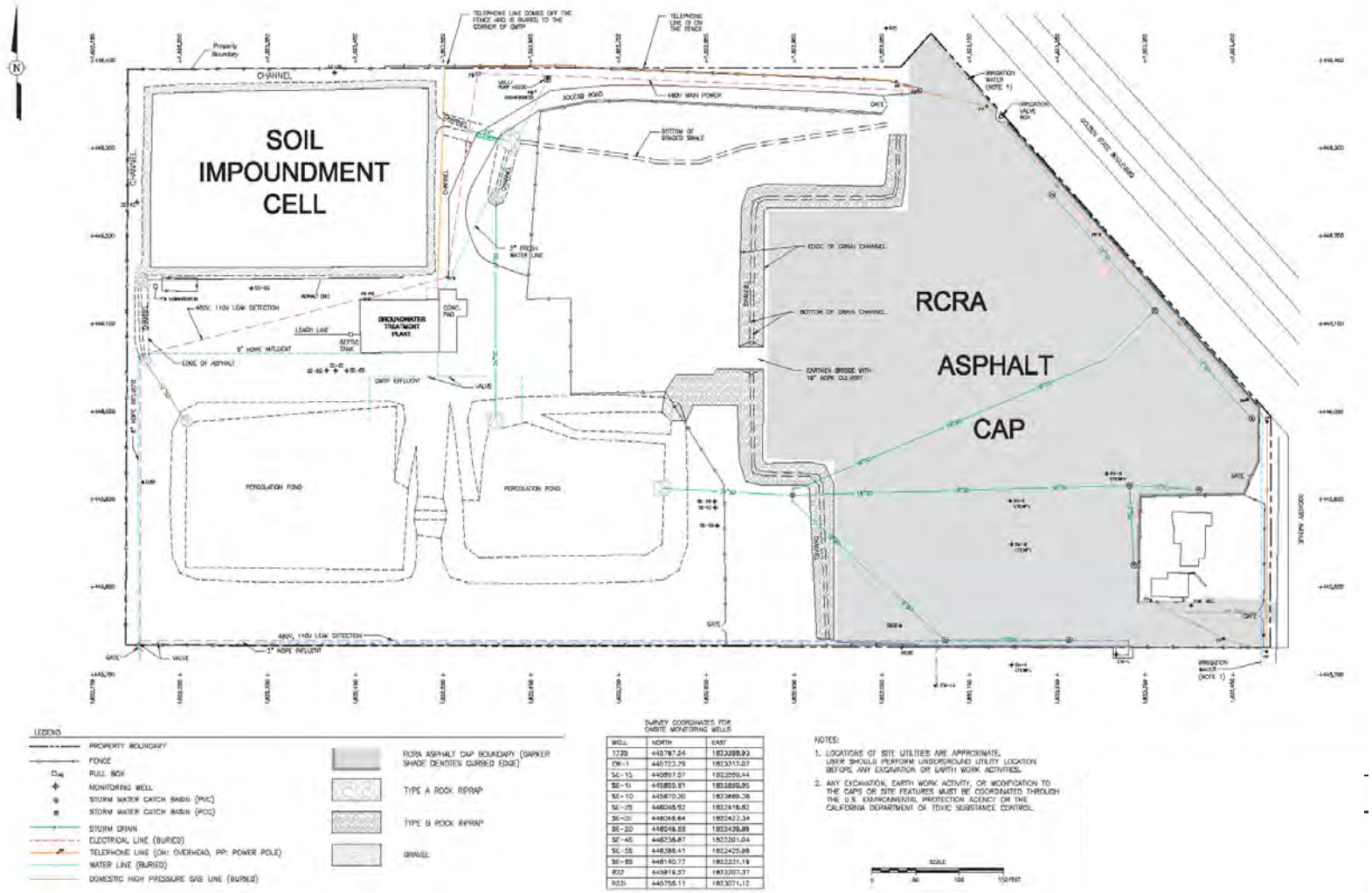


Figure 3. Detailed Location Map for the Selma Pressure Treating Company Superfund Site

1.3. Hydrology

The Site subsurface geology consists of a heterogeneous assemblage of sand and silt, with discontinuous lenses of clay. The water table surface is nearly planar and dips slightly to the southwest, with a gradient of approximately 0.004 feet/foot. The aquifer underlying the Site is unconfined and contains discontinuous fine-grained lenses and cemented zones that act as localized barriers to groundwater flow and contaminant transport. Based on groundwater modeling, the estimated horizontal and vertical hydraulic conductivities are 10 feet/day and 0.1 feet/day, respectively. As part of historical remedial investigation activities, the uppermost water-bearing unit of this aquifer was divided into zones based on the degree of stratification of groundwater flow and contaminant transport: a shallow zone from about 20 to 50 feet below ground surface (bgs), an intermediate zone from about 45 to 75 feet bgs, and a deep zone from about 75 to 120 feet bgs. Hydrogeology and lithology is not well-defined downgradient of the Site.

Groundwater elevation levels at the Site have generally trended downward from the beginning of post construction monitoring at the Site in 1997. This is attributed to regional agricultural activity that relies on groundwater for irrigation. The downward trend has accelerated in recent years with the multiyear drought that began in 2012. Declining groundwater levels have resulted in many of the shallow and intermediate zone wells at and near the Site to go dry, thus impeding both groundwater monitoring and operation of the groundwater remediation activities at the Site.

2. Remedial Actions Summary

2.1. Basis for Taking Action

The contaminants of concern are total chromium, arsenic, copper, dioxins/furans and pentachlorophenol (PCP). According to the Record of Decision (ROD), contaminants of concern (COCs) that are primary risk drivers for soil at the Site are arsenic and dioxins/furans. Chromium (total) was the only contaminant of concern found in groundwater at concentrations that posed a risk to human health through ingestion.

Exposure pathways for the Site soils included exposure via ingestion and dermal contact with contaminated soil (including incidental ingestion), and inhalation of contaminated dust. Receptors included both nearby residents and onsite workers. Exposure to contaminated groundwater via ingestion was the pathway of concern for groundwater. Receptors included both nearby residents and onsite workers.

2.2. Remedy Selection

2.2.1. Soil Remedy

In the 1988 ROD, EPA selected a soil remedy consisting of excavating soil containing contaminants of concern at concentrations that exceeded cleanup levels, treating the soils with a fixing agent, replacement of treated soil into excavated areas, and covering the treated soil areas with a Resource Conservation and Recovery Act (RCRA) cap. The soil remedy includes long-term monitoring of soil impoundment and

access and land use restrictions for capped areas. The ROD set cleanup standards for soil COCs to prevent human exposure. (In the 2003 ROD Amendment, EPA determined that due to consistently low concentrations of arsenic, PCP, and dioxins/furan detected in groundwater, remediation of soil containing those chemicals was not required in order to protect groundwater. However, remediation of these COCs in soil was necessary in order to prevent direct human exposure.)

The 1993 Explanation of Significant Differences (ESD) lowered the soil cleanup standard for arsenic from 50 mg/kg to 25 mg/kg and established a soil cleanup standard for PCP of 17 mg/kg. As a result, excavation for an additional 5,000 cubic yards of soil from areas within and just outside the Site wood treatment plant property where operations had deposited COCs on public right of ways and adjacent properties was conducted. The excavated soil was stockpiled on-site and the excavation area was backfilled with clean soil.

Following these excavations, and based on results of Site soil investigations, EPA identified additional areas where concentrations of COCs in soil exceed cleanup standards. Since the volume of contaminated soil was significantly higher than the 1988 ROD estimate, EPA issued a ROD Amendment in 2003. The 2003 ROD Amendment revised the Remedial Action Objectives for soil as follows:

- Mitigate human exposure through inhalation, skin contact, and incidental ingestion to soil containing arsenic, PCP, and/or dioxins/furans at concentrations that exceed the cleanup standards established in the [1993] ESD to the ROD.

In the 2003 ROD Amendment, EPA determined that due to consistently low concentrations of arsenic, PCP, and dioxins/furans detected in groundwater, remediation of soil containing those chemicals was not required in order to protect groundwater. However, remediation of these COCs in soil was necessary in order to prevent direct human exposure.

The selected remedy for soil under the 2003 ROD Amendment included the following elements:

- Excavation of contaminated soil (approximately 21,000 cubic yards) to depths of five feet in the processing areas of the Site, which is the eastern portion of the Site adjacent to Dockery Avenue.

- Removal of the upper portion of the RCRA cap over the impounded soil from the previous soil remediation activity, the placement of the newly excavated soil and demolition debris (actual volume 40,000 cubic yards) in the same impoundment, as well as the approximately 5,000 cubic yards of stockpiled soil left from a 1999 removal effort, and capping of the soil impoundment cell with an RCRA-equivalent vegetative cover.

- Backfill of the excavated areas and covering them with a low permeability asphalt cap.

- Establishment of institutional controls to prevent exposure to any contaminated soil remaining below depths of five feet.

Table 2. Cleanup Standards for Soil

Contaminants of Concern	Standard (milligrams per kilogram [mg/kg])	Source
Pentachlorophenol (PCP)	17	1993 ESD
Arsenic	25	1993 ESD
Dioxins/furans	0.001	1988 ROD

2.2.2. Groundwater Remedy

In the 1988 ROD, EPA selected a groundwater remedy that would employ a conventional extraction and ex-situ precipitation, coagulation, and flocculation treatment process to remove (total) chromium to meet the applicable drinking water standard, with either re-injection or offsite disposal of the treated effluent, and groundwater monitoring to verify contaminant cleanup. The remedial action objective for the groundwater remedy, as stated in the 1988 Feasibility Study was:

- Mitigation of exposure from ingestion of groundwater containing concentrations exceeding Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act and the State of California Standards for chromium.

Four ESDs (Table 3) have been issued that modified or explained aspects of the groundwater remedy for the Site. In 1993, EPA issued the first ESD, which established groundwater treatment phases and allowed for a more observational approach for the siting and design of new wells. In 1997, EPA determined through a second ESD, that any concentrations of PCP in groundwater are below 1 µg/L and that (total) chromium is the primary contaminant in groundwater at the Site. EPA determined in 1997 that discharges of the treated effluent to percolation ponds were allowed. A third ESD was issued in 2005, which added in-situ bioremediation to the groundwater remedy to accelerate cleanup. The technology consists of injecting molasses amended groundwater to create a reducing environment in order to convert chromium from the mobile hexavalent form to the relatively immobile trivalent form. The fourth ESD was issued in 2013 to create an institutional control (IC) in the form of a governmental notification system when new well development is proposed on an expanded area beyond the boundaries of the Site. When the State of California Department of Toxic Substances Control (DTSC) office receives notice from the County of Fresno that a new well is to be constructed in the land use control (LUC) monitoring area, DTSC will contact the property owner and develop appropriate restrictions or conditions for well development on the owner's parcel (Figure 4).

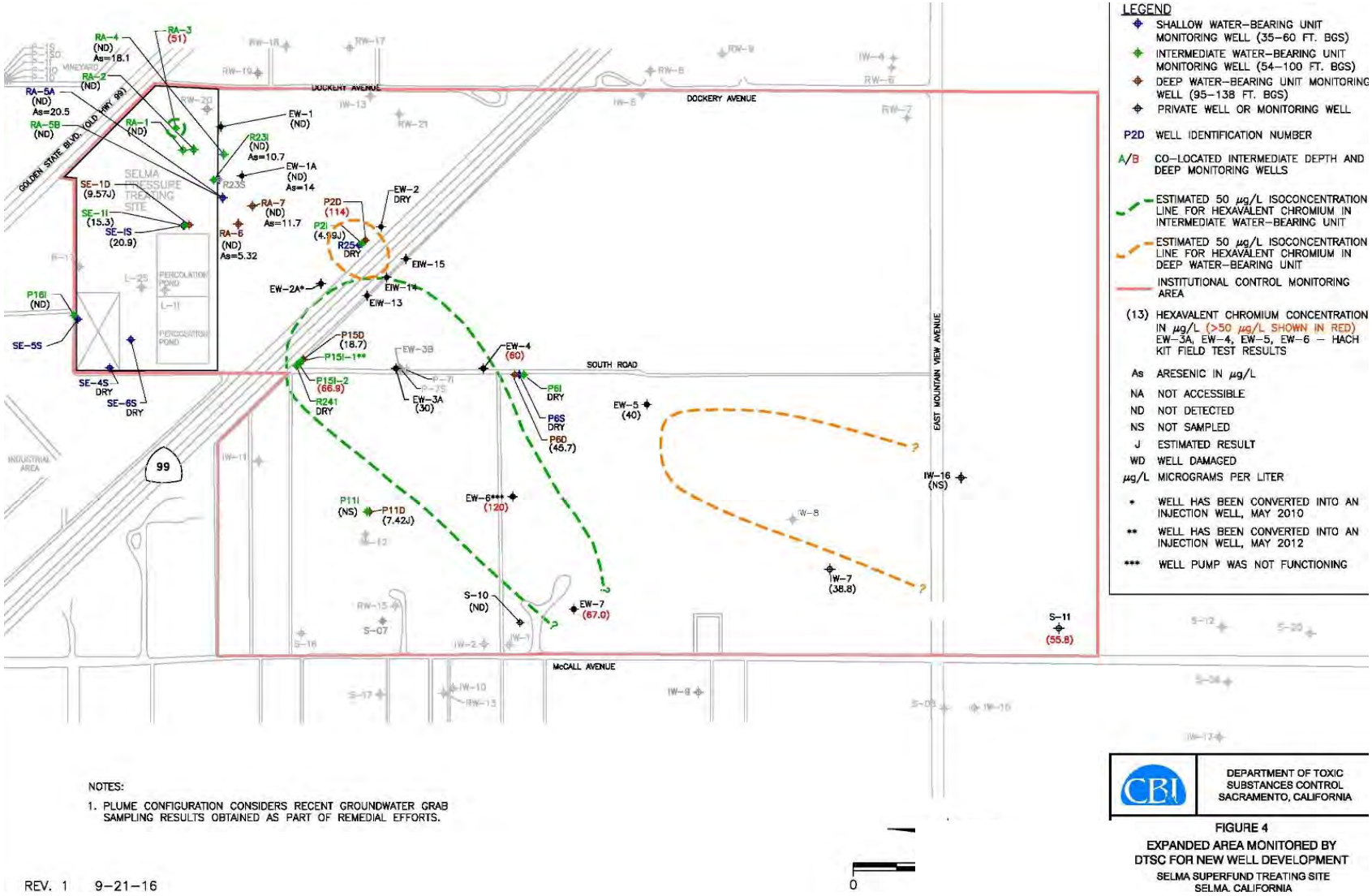


Figure 4 DTSC expanded monitoring area for new well development

Table 3 List of ESDs for the Groundwater Remedy

Groundwater ESDs	Date	Modification
1993 ESD	October 1993	Established a groundwater cleanup level for PCP of 1 µg/L. Modified the implementation of the groundwater treatment to reflect a phased, observational approach (i.e. adaptive management of the groundwater remedy).
1997 ESD	April 1997	Added percolation ponds as the preferred means of returning treated groundwater to the aquifer. Determined that concentrations of PCP in groundwater are below 1 µg/L and that (total) chromium is the primary contaminant in groundwater at the Site.
2005 ESD	August 2005	Supplemented the groundwater remedy with an in-situ bioremediation (ISB) groundwater treatment system to be implemented in phases (Figure 2). States that hexavalent chromium presents the highest Site groundwater risks.
2015 ESD	September 2013	Enhances the institutional controls at the Site by expanding the area that DTSC or its contractor monitors for new well installation within or near the plume areas beyond the Site property.

The groundwater cleanup standards for total chromium (50 µg/L) and arsenic (50 µg/L) were based on the MCLs established under both the Federal and State Safe Drinking Water Acts at the time of the 1988 ROD. At the time of the ROD, there was no California or Federal MCL for hexavalent chromium. Cleanup standards for groundwater are summarized in Table 4.

Table 4. Cleanup Standards for Groundwater

Contaminants of Concern	Standard (µg/L)	Source
Chromium (total)	50	1988 ROD
Arsenic	50	1988 ROD

2.3. Remedy Implementation

2.3.1. Soil Remedy

All soil remedy components have been performed and completed in accordance with the 1988 ROD, 1993 ESD, and 2003 ROD Amendment. Engineering and Institutional Controls are in place to prevent exposure to contaminated soils.

Between 1991 and 1993, approximately 13,000 cubic yards of contaminated soil was mixed with a fixative and placed in an onsite impoundment. After the 1993 ESD was signed, an additional 5,000 cubic yards of contaminated soil from the wood processing area were stockpiled and added to the onsite impoundment in 1999. In 2003, a RCRA liner and vegetative cap were installed on the impoundment and

a fence was installed around the impoundment. The excavated areas were backfilled and covered with a low-permeability RCRA asphalt cap in 2004.

2.3.2. Groundwater Remedy

The groundwater extraction and treatment system was constructed in the summer of 1998. The method of operation of the original treatment process was to precipitate metals from the groundwater and concentrate the precipitated material prior to disposal at an offsite, permitted RCRA disposal facility.

The implementation of the in situ bioremediation (ISB) occurred in phases with each phase designed for a specific area (Figure 2). Phases 1 and 2A utilized direct injection of molasses and were completed in 2005. Phases 2B through 3B utilize longer term recirculation methods to inject a more diluted substrate over a longer period of time. Phase 2B was performed between July 2006 and October 2007 at the area of the property between the phase 2A area and Highway 99. Phase 3 was performed between November 2007 and May 2008 and covered the western end of the property and the area under the footprint of the Highway 99. In June 2008, Phase 3 was converted to Phase 3A with the shutdown of groundwater treatment plant operations and connection of the groundwater treatment plant extraction wells on the west side of Highway 99 to the ISB mixing skid, which moved the extraction of groundwater by the treatment system to the east side of the highway. In May 2009, Phase 3A was converted to Phase 3B with conversion of the extraction wells along the eastern side of Highway 99 into injection wells.

2.3.3. Institutional Controls

An environmental covenant restricting the use of the property was executed in April 2006 and recorded by the Fresno County Recorder's office (Appendix D). The environmental covenant prohibits the following:

- All residential, school, or hospital uses of the property.
- Extraction of groundwater.
- Changes to drainage at the Site.
- Activity or building at the soil impoundment cell.
- Disturbance of the asphalt cap.

Institutional Controls have been established to maintain industrial use of the Site and to limit future construction activities to ensure that the cap remains protective (Table 5). The environmental covenant to restrict use of the property will transfer with the property to new owners whenever it is sold. All remaining onsite soils with contamination above the cleanup levels are capped and contained within the area addressed in the environmental covenant. As part of the environmental covenant, the property owner is responsible for inspecting the Site at the beginning of each year to verify that site conditions are in conformance with the deed restrictions. A report of the annual site inspection is due to the DTSC by January 15 of each year. DTSC is responsible for reviewing the annual reports and working with the property owner to ensure they are filed in a timely and accurate manner.

The 2013 ESD expands the existing land use control prohibitions on extraction of groundwater beyond the Site property. The boundaries of the expanded LUC area, monitored by DTSC, for new well

development are bounded by Dockery Avenue to the East, McCall Avenue to the West, East Mountain View Avenue to the South and generally Golden State Blvd (Old Highway 99) to the North.

Table 5. Summary of Planned and/or Implemented Institutional Controls

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Fresno County Parcel Numbers 39-011-057 and 39-011-059	The environmental covenant prohibits the following uses of the property: Residential, Hospital, School, Day Care, and Elder Care Extraction of groundwater, grading, and excavation activities are prohibited.	Covenant to Restrict Use of Property, Environmental Restriction, June 22, 2006
Groundwater	Yes	Yes	See text for the area monitored by DTSC.	The 2013 ESD expands the area monitored by DTSC for notice of new well development.	Governmental IC; no real estate instrument was recorded in association with this land use control.

2.4. Operations and Maintenance

2.4.1. Soil Remedy

The soil remedy includes groundwater monitoring at three well locations around the soil impoundment. These wells were installed in 2002, but have not been sampled since March 2008 due to an areal groundwater elevation decline to below the monitoring wells screened intervals. In March 2008, the groundwater analytical sampling results were not detectable for arsenic and hexavalent chromium, and 12.9 µg/L for total chromium. The vegetative cap of the soil impoundment is maintained by annual mowing and herbicide application as needed to control the growth of weeds and unwanted vegetation.

2.4.2. Groundwater Remedy

The long-term groundwater monitoring program began in February 1999. Long-term groundwater monitoring consists of semiannual sampling of monitoring wells and select residential wells within the perimeter of the contaminant plume. Water from the residential wells is used for drinking water supply, landscape irrigation, and other outdoor uses. In addition, the contractor for the groundwater remedy collects monthly samples and records flow rates and water levels for each of the extraction wells of the ISB remedial system. The primary objectives for groundwater sampling and monitoring are to evaluate the effectiveness of the hexavalent chromium remediation and to monitor and evaluate the overall effectiveness of the treatment system's containment of the hexavalent chromium plume.

3. Progress Since the Last Five-Year Review

3.1. Previous Five-Year Review Protectiveness Statement and Issues

The protectiveness statement from the 2011 FYR for the Selma Pressure Treating Company Site stated the following:

> The remedy at the Selma Pressure Treating Co Superfund Site is currently protective of human health and the environment because there is no exposure. All areas containing contaminated soil above the cleanup level has been excavated and/or capped. Institutional controls are in place for the soil remedy and to restrict the use of on-site groundwater. The EPA has informed property owners near the Site, and staff with the City of Selma and the Fresno County well permitting authority of the existing chromium plume.

The 2011 FYR included four issues and recommendations. Each recommendation and the current status are discussed in Table 6.

Table 6. Status of Recommendations from the 2011 Five-Year Review

Remedy	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Groundwater	Due to a decline in the regional groundwater table, the monitoring wells used to monitor for potential migration of contaminants from the soil impoundment cell to the groundwater have gone dry.	Installation of new, deeper monitoring wells to monitor for potential migration of contaminants from the soil impoundment to groundwater.	Considered But Not Implemented	Due to continued decreasing groundwater water levels and the integrity of the cap, it is unlikely any releases have occurred. If a release has occurred, it is unlikely it would have migrated to the deeper water. If water levels rise, monitoring wells should be re-considered.	N/A
Groundwater	An evaluation of groundwater analytical sampling results from the residential well located downgradient of the Site indicates that concentrations of hexavalent chromium are above the cleanup standard and exhibit a significant increasing concentration trend. This well is currently the most downgradient monitoring point for the groundwater contaminant plume.	An investigation of the increasing trend in [hexavalent] chromium groundwater concentrations observed in analytical sampling results for at a residential well. Based on the use of the water from this well, perform an appropriate risk assessment using the most recent toxicity information for hexavalent chromium. Install new monitoring wells to define the downgradient extent of contamination.	Completed	In 2016, after determining that two wells were being used for potable water supply, DTSC began providing bottle water to one affected resident, and EPA is installing on-site wellhead reverse osmosis treatment systems.	September 2016
Groundwater	There are an insufficient number of monitoring wells on the west side of the highway to monitor the performance of the in situ bioremediation system.	Install additional monitoring wells on the west side of the highway to monitor the performance of the in-situ bioremediation system	Under Discussion	EPA is investigating the full extent of the hexavalent chromium groundwater plume. However, no new wells have been installed within the ISB treatment area.	N/A

Groundwater	Existing governmental controls on city property are sufficient to prohibit exposure to contaminated water; however, implementation of a similar governmental control is needed for portions of the Site on county property.	Provide plume maps of the contaminated groundwater areas (i.e., intermediate and deep water bearing units) to the County of Fresno (well permitting). The maps will be used by the County to restrict construction of potable water supply wells in the contaminant plume until remedial cleanup standards are met. Provide updated plume maps as needed (e.g., when new monitoring wells are constructed). An ESD will be required.	Completed	The 2013 ESD supplements the LUC by expanding the area of the Site that DTSC monitors to track groundwater extraction in and near the plume areas beyond the Site property covered by the LUC.	9/30/2013

3.2. Work Completed at the Site During this Five-Year Review Period

The in situ bioremediation (IBS) treatment system remedy continues, but with only extraction well EW-5 operating since November 2015. The other extraction wells, EW-3A, EW-4, EW-6, and EW-7, were not operating due to low groundwater levels. The typical flow rate observed from EW-5 is between 55 and 60 gallons per minute. The groundwater/molasses mixture is currently injected into injection wells IW-07, IW-09, and IW-11, located just east of Highway 99. IW-06 was operational until June 2016 when high backpressure was observed at the well, so IW-11 was brought online to allow IW-06 pressure to subside.

DTSC started using an institutional control, which is a monitoring and government notification system as described in the 2013 ESD. DTSC is notified when individuals have contacted Underground Service Alert, an underground utility locating service, for work within approximately a mile and a half of the site. DTSC reviews the alerts to see if any of the proposed work affects the requirements specified in the LUC, including proposed activities such as drilling a well. The 2013 ESD was created to notify DTSC of any proposed well installations within contaminated portions of the plume beyond the Site property. DTSC has received approximately 20 alerts over the past few years.

In 2015, EPA started field work for a groundwater remedial investigation to delineate the hexavalent chromium and total chromium groundwater plume that extends south of the Site property. The remedial investigation includes analytical sampling results from groundwater samples collected from private wells and DTSC monitoring wells. EPA and the California Department of Toxic Substances Control (DTSC) have not yet been able to sample wells located further east of S. McCall Ave.

Remedial investigation analytical sampling results reported concentrations of total chromium and hexavalent chromium above the Site chromium groundwater cleanup standard and/or the State of California MCL for hexavalent chromium, respectively, at two private wells within the extent of the remedial investigation area. To prevent exposure to hexavalent chromium, DTSC is providing bottled water to one residential property with a private well exceeding the Site groundwater cleanup level and/or the California MCL for hexavalent chromium. In addition, EPA will install on-site reverse osmosis treatment system to the other residential property to reduce hexavalent chromium concentrations to below the California MCL. This removal action is authorized through an EPA Action Memo (EPA 2016). Additional work planned in the remedial investigation includes the use of cone penetrometer or direct push testing to further characterize the groundwater and geology in five groundwater plume step-out locations, and the installation of five new monitoring wells. EPA will sample any additional private wells (e.g. east of S. McCall Ave.), and a provide treatment system, if necessary.

4. Five-Year Review Process

4.1. Community Notification and Site Interviews

A public notice was published in the *Selma Enterprise Kingsburg Reporter* in Fresno County, California on June 8, 2016, stating that there was a Five-Year Review and inviting the public to submit any

comments to EPA. The Five-Year Review report was made available at the Site information repository located at the Fresno County Library, Selma Branch, 2200 Selma Street, Selma, CA 93662.

Interviews were conducted with representatives of Geosyntec Consultants, Inc., the current contractor in charge of operations and maintenance (O&M) of the groundwater remedy, and with representatives of CB&I, the prior O&M contractor and current contractor for the EPA chromium groundwater plume investigation. A full description of questions and answers for these interviews can be found in Appendix G.

Geosyntec noted that operation of the ISB groundwater system had been hampered by the reliability of electrical utilities in the area and by falling groundwater levels. Power interruptions have caused ISB system downtime in the past, but recent installation of an uninterruptable power supply and future automation upgrades should mitigate unreliable electricity interruptions in the future. By 2015, they could only extract groundwater from one extraction well due to falling groundwater levels. Extraction of groundwater has declined to 50 gallons per minute due to declining water levels in the area.

CB&I concurred with Geosyntec's description of difficulties in operating the ISB system. They noted that while great progress had been made to reduce the mass of contamination present in groundwater, current levels in groundwater do not meet the Site groundwater cleanup level for total chromium or the new State of California MCL for hexavalent chromium.

4.2. Data Review

Data from the following studies and reports were reviewed as part of the Five-Year Review process:

- Monitoring Well Sampling Reports dated November 2014, May 2015, and October 2015 (CB&I 2014, 2015a, and 2015b).
- Figure from CB&I summarizing extraction well hexavalent chromium trends during ISB treatment from 2008 to 2016
- Data from October 2015 and April 2016 Groundwater sampling event

In-depth descriptions of these studies and reports, as well as an interpretation of the data they contain, are given in Appendix B.

As part of historical remedial investigation activities, the uppermost water-bearing unit of the aquifer was divided into 3 zones based on the degree of stratification of groundwater flow and contaminant transport: a shallow zone from about 20 to 50 feet below ground surface (bgs), an intermediate zone from about 45 to 75 feet bgs, and a deep zone from about 75 to 120 feet bgs. However, several of the intermediate and deep wells had groundwater depths that overlapped the "shallow" and "intermediate" characterization depths. For example, P21I (intermediate) had a groundwater depth averaging 41 feet bgs (1997 to 2016) which would place it in the "shallow" zone. Well P2D (deep) had a groundwater depth averaging 43 feet bgs (1997 to 2015) which also would place it in the "shallow" zone. Therefore, while the wells are identified by zone (S, I, or D) the depth to groundwater may occur in a differently designated groundwater zone.

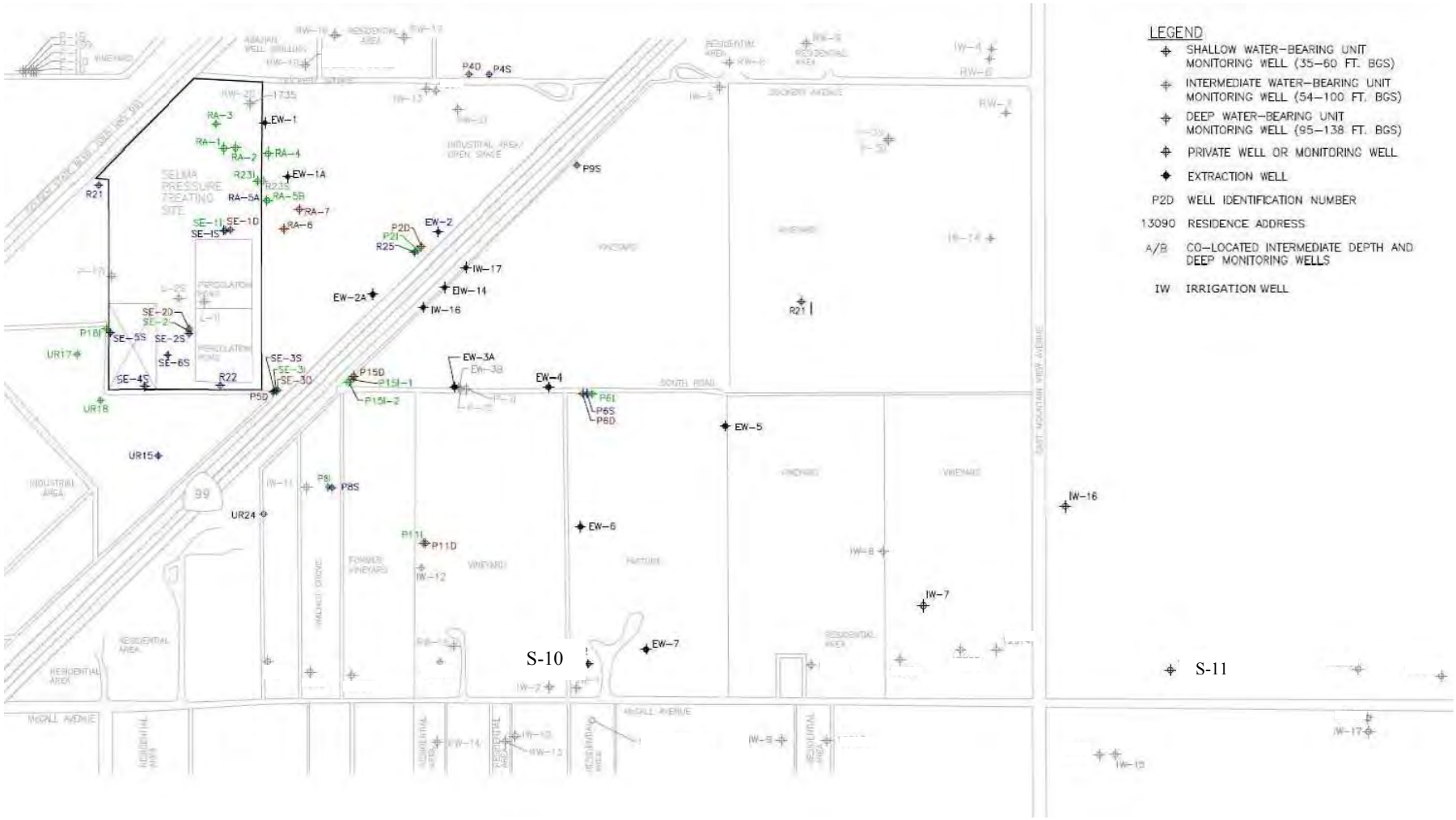


Figure 5 Location of monitoring wells

Water levels have declined due to ongoing drought and the use of groundwater for agriculture irrigation. In the past three years, several monitoring wells have gone dry and most of the extraction wells do not sustain groundwater extraction anymore. Depth to groundwater in December 1997 was approximately 35 feet below grade in the shallow and intermediate-depth wells. By October 2015, the groundwater had declined to approximately 55 feet below grade and many wells (most shallow and intermediate depths) had gone dry. The deep wells have had the groundwater depth decline between 30 to 40 feet since 1997. Recently, the deep water levels decreased approximately 6 feet between May 2015 and October 2015. During the October 2015 groundwater sampling event, 13 wells had sufficient water to retrieve samples, and 12 wells (P2I, P6S, P6I, P15I-2, P16I, R23I, R24I, R25, SE-1S, SE-1I, SE-4S, and SE-6S) were dry (CB&I, 2015b). Operation of the ISB remediation system now operates only one extraction well (EW-5) due to lack of water, leading to a declining extracted groundwater volume that can be circulated in the injection wells.

Groundwater contamination remains above the cleanup standards, and has shown no appreciable decreasing trends. The average hexavalent chromium concentrations exceeds the 2014 California MCL of 10 µg/L for all of the wells for which data was analyzed. The average hexavalent chromium levels were above 50 µg/L, the cleanup standard for total chromium, at four of the sixteen wells sampled during this review period (SE-1I, P15I-2, EW-7, and IW-16). Mann-Kendall trend analysis was performed for those wells that had sufficient quantity of data available (Table 7). Mann-Kendall trend analysis is a statistical test that examines a series of data points to determine whether any trends present are due to actual increases or decreases rather than variation due to chance. Trend analysis for historically impacted well data show that contamination levels appear to be generally constant or have no discernable trend. Of the wells for which data were analyzed, six are currently dry. In reviewing the data, it appears that there may be a slight decrease in concentrations over the past five years; however, there is not enough statistical robustness to show a Mann-Kendall trend.

Table 7. Summary of Hexavalent Chromium Data from January 2011 to April 2016

Well	# of exceedances above 50 µg/L	# of exceedances above 10 µg/L	Average Hexavalent Chromium Concentration (µg/L)	Current Status	Trend (Mann-Kendall Analysis)
RA-3	1	2	*21.6*	Dry after May 2015	No trend
SE-1I	4	7	**133.2**	Dry after May 2015	No trend
SE-1S	0	3	*17.6*	Dry after May 2014	No trend
RA-5B	1	4	*25.7*	Active	No trend
P15D	0	8	*20.5*	Active	No trend
P15I-2	2	4	**50.6**	Dry after May 2013	Upward trend
R24I	1	4	*47.2*	Dry after July 2002	No trend
P2D	2	3	*20.8*	Active	No trend
P11D	0	4	*13*	Active	No trend
P6I	0	1	*10.1*	Dry after May 2014	No trend
P6D	2	11	*44*	Active	No trend
12632	0	7	*12.7*	Active	No trend
EW-7	4	4	**81.4**	Converted into an injection well in May 2012	No trend
IW-7	4	10	*44.2*	Active	No trend
IW-16	7	8	**79.6**	Active	No trend
S-11	6	9	*49.3*	Active	No trend

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of 50 µg/L hexavalent chromium are in bold type.
- For purposes of statistical calculation, ½ the reporting limit was used for non-detects.
- U = non-detect; value listed is the reporting limit
- J = estimated value

The long-term trends show that the concentration of hexavalent chromium in the extraction wells has fallen over time during operation of the ISB treatment system, but projected trends for extraction wells predict that hexavalent chromium concentrations in extraction wells will reach asymptotic levels below 50 µg/L[1] hexavalent chromium but above 10 µg/L hexavalent chromium (Table 8). Over the past five years, the trend of hexavalent concentrations[2] in the extraction wells with data have been fairly asymptotic, indicating reduced effectiveness in the ISB treatment(Figure 6). The flattening trend may be related to the difficulty of operating the ISB treatment system due to declining water levels in the extraction wells and reduced operation of the recirculation system for the ISB. In addition, the flattening trend may be related to the decreased concentration gradient between low permeability soil lenses with elevated hexavalent chromium concentrations and groundwater. A conclusion about the progress of ISB

[1] The groundwater cleanup level established by the ROD for total chromium is 50 µg/L; the 2014 California MCL for hexavalent chromium is 10 µg/L. It is assumed that the total chromium concentration is at least equal to or higher than the hexavalent chromium concentrations. Hexavalent chromium data is therefore used to estimate compliance with the total chromium groundwater cleanup standard.

[2] The results for the extraction wells sampling are from Hach Kit field tests; data of this quality is limited to field screening purposes only. However, for the purposes of this FYR, it is assumed that the Hach Kit field tests are representative of actual groundwater concentrations.

to achieve the cleanup levels cannot be made; however, it is unlikely that the cleanup goals can be achieved in a reasonable timeframe with only one extraction well operating.

Table 8. Hexavalent Chromium Trend Analysis Summary – Phase 3B Extraction Wells May 2008 to October 2015

	Well ID:				
	EW-3A	**EW-4**	**EW-6**	**EW-5**	**EW-7**
# of exceedances above 50 µg/L	14	16	15	10	1
# of exceedances above 10 µg/L	16	16	15	18	2
Average Hexavalent Chromium Concentration (µg/L)	**93**	**129**	**197**	**70**	**60**
Trend since 2008 (Mann-Kendall Analysis)	Downward trend	Downward trend	Downward trend	Downward trend	insufficient data for trend analysis
Trend since 2011 (Mann-Kendall Analysis	Downward trend	Downward trend	No trend	No trend	insufficient data for trend analysis

- See notes in Table 7
- Data in this table is a summary of data collected using a Hach field test kit.

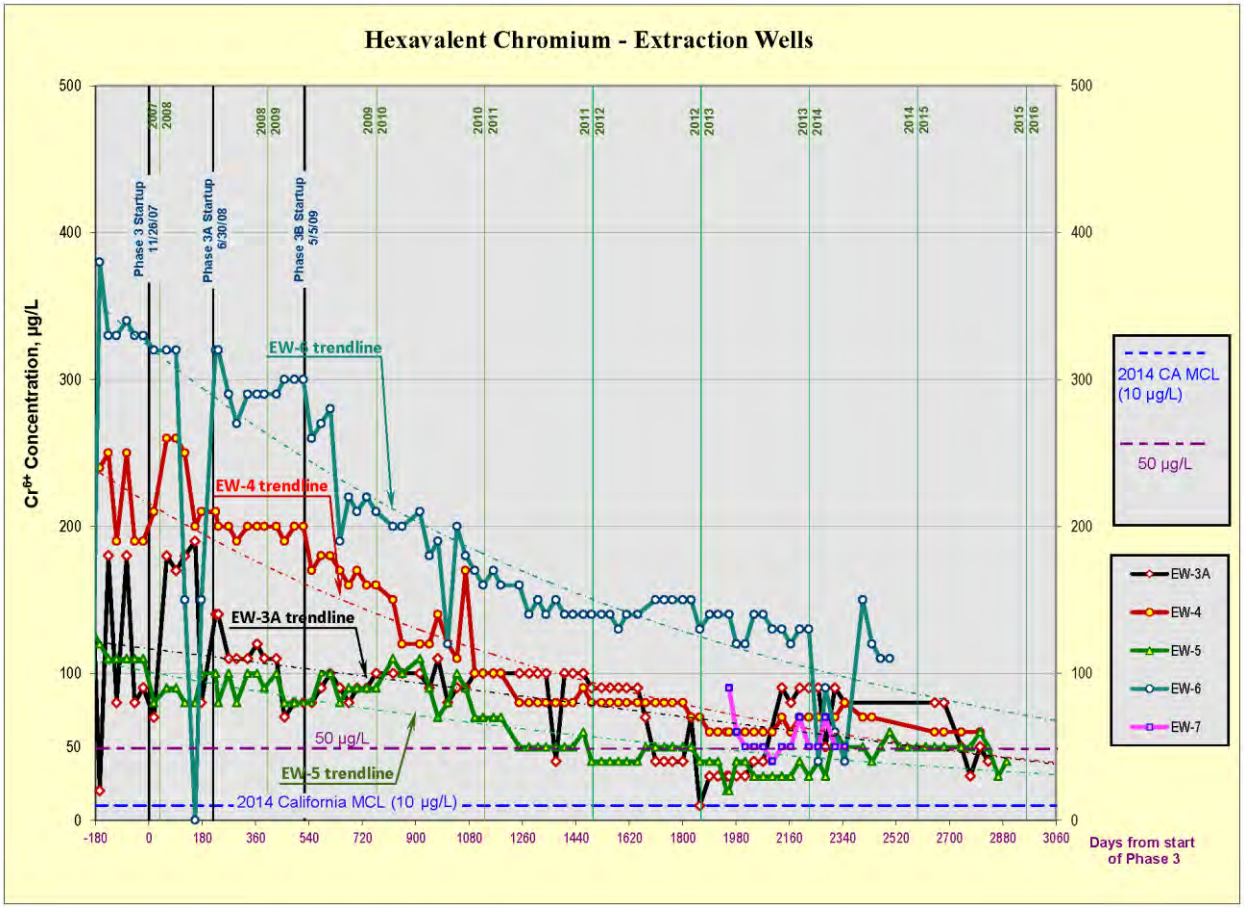


Figure 6. Phase 3B Extraction Wells Hexavalent Chromium Trends

For private wells downgradient of the extraction well network, average hexavalent chromium concentrations are currently above 10 µg/L at in six wells (Table 9). Four of these wells are currently being used for irrigation and two wells are for domestic uses. One irrigation well (IW-16) has average hexavalent chromium concentration above 50 µg/L, indicating that the groundwater in this area probably exceeds the total chromium cleanup standard[3].

To address the lack of plume definition to the southwest of the Site, EPA sampled twelve downgradient domestic wells and five irrigation wells in October 2015 and April 2016. As a result of the testing, two additional irrigation wells (IW-15 and IW-9) were identified as exceeding the 2014 California MCL for hexavalent chromium. Table 9 shows that several of these wells are experiencing increasing hexavalent chromium concentrations. EPA is planning to install permanent monitoring wells along the edge of the plume.

[3] The groundwater cleanup level established by the ROD is 50 µg/L total chromium; the 2014 California MCL for hexavalent chromium is 10 µg/L. It is assumed that the total chromium concentration is at least equal or even higher than the hexavalent chromium concentrations. Hexavalent chromium data is therefore used to estimate compliance with the site cleanup level.

Table 9. Summary of Private Wells Sampled with Exceedances in October 2015 and April 2016

Well ID	Sample Date	Hexavalent Chromium µg/L (Filtered)	Total Chromium µg/L (Filtered)
Domestic Wells			
S-10	**April 2016**	18	19
	October 2015	14.5	18.9
S-11	**April 2016**	**75**	**92**
	October 2015	**84.7**	**103**
Irrigation Wells			
IW-7	**April 2016**	45	48
	October 2015	29.9	46
IW-16	**April 2016**	**72**	**75**
	October 2015	**52**	**64.3**
IW-15	**April 2016**	33	33
	October 2015	7.02	7.67
IW-9B	**April 2016**	6.5	6.4
	October 2015		16.3

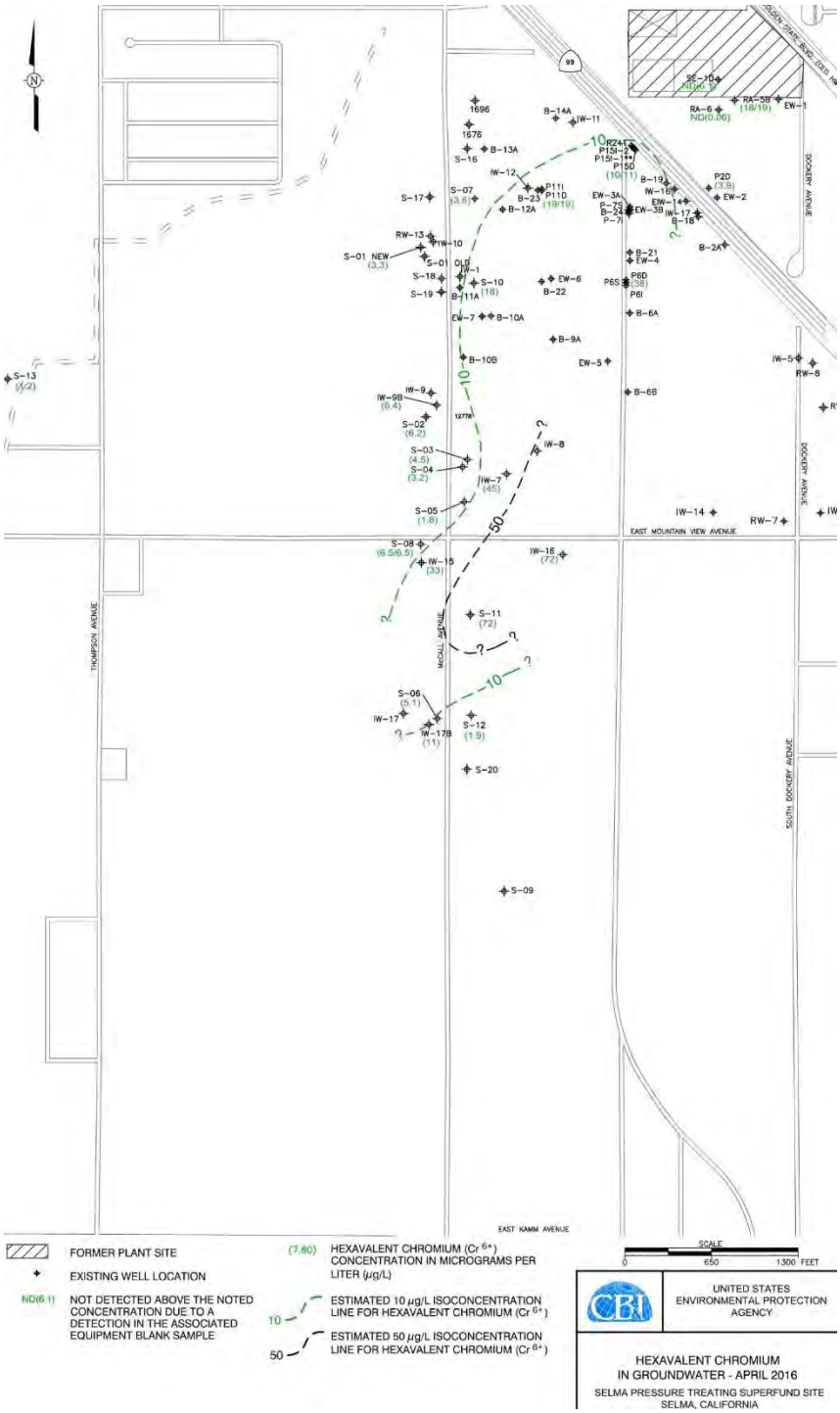


Figure 7. 2016 Groundwater Sample Results and Estimated Hexavalent Chromium Plume Boundary

4.3. Site Inspection

The inspection of the Site was conducted on January 26, 2016. In attendance were Grace Ma, Remedial Project Manager, EPA; Tim Patenaude, Project Manager, DTSC; Blair Kinser, Environmental Engineer,

USACE; Scott Forbess, Site Manager, Geosyntec, Inc.; and Nicholas White, Site Operator, Geosyntec, Inc. The purpose of the inspection was to assess the effectiveness and protectiveness of the remedy.

Attendees walked the Site and inspected the following features:

- Soil impoundment and cap
- RCRA asphalt cap
- Former groundwater treatment building
- Groundwater in situ bioremediation treatment skid

Attendees inspected the onsite soil impoundment, groundwater treatment building, the offsite Phase 3B ISB groundwater system, as well as selected monitoring wells and vaults.

Minor settlement was observed at the southwest portion of the soil impoundment, presumably due to the animal burrowing observed in this area. Some water ponding at a concrete cleaning pad was observed at the onsite groundwater treatment building. The offsite Phase 3B ISB groundwater injection system had minor leaks at two gaskets and at a valve. The asphalt cap is in generally good condition. The area of the asphalt cap currently being used as a recycling facility covers nearly 30% of the surface. Wells and vaults inspected appear to be in good repair. A full description of Site inspection activities and conclusions can be found in Appendix I.

5. Technical Assessment

5.1. Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The groundwater remedy is not functioning as intended by the decision documents. Levels of total chromium in monitoring wells and downgradient private wells exceed the Site groundwater cleanup standard of 50 µg/L total chromium. The declining groundwater levels have caused many monitoring wells to go dry, interfering with the ability to collect data about the progress of the groundwater remedy and the extent of the hexavalent chromium groundwater plume. Future declines in extraction well contaminant concentrations are not likely to continue as these wells cannot sustain groundwater extraction due to the decline in water levels. Likewise, the ability of the extraction wells to provide groundwater plume containment is called into question due to declining water levels at the Site, which caused all but one of the extraction wells to go dry in 2014 and 2015 (CB&I 2014, 2015a, and 2015b). Achievement of Site cleanup standards for groundwater with the current groundwater treatment system is not likely. Furthermore, the in situ bioremediation system was not designed to treat the downgradient portion of the chromium groundwater plume. Some downgradient private wells have been impacted by chromium in groundwater at concentrations that exceed the Site cleanup standard for total chromium (50 µg/L) or the California MCL for hexavalent chromium (10 µg/L).

Institutional Controls for the groundwater remedy were established by the 2006 Environmental Covenant restricting land and groundwater use at the Site (Appendix D) and the 2013 ESD (EPA, 2013). The 2013

ESD established an area downgradient of the Site that DTSC will monitor for new well construction. DTSC will receive notices of planned new well development in this area, prevent construction of wells in areas of the groundwater contamination, and provide direction to landowners for proper construction of wells in uncontaminated groundwater areas. DTSC has received approximately 20 notices since the previous FYR.

The remedial action for soil continues to operate and function as designed. The soil cap on the soil impoundment and the asphalt cap on the eastern portion of the Site are functioning in accordance with the remedial design and are effective in preventing human exposure to contaminated soils. Operations and Maintenance activities at the soil impoundment cap and the asphalt cap appear to be effective in maintaining the integrity of the caps and preventing human exposures to contaminants left in place at the Site (Appendix I). Institutional Controls for the soil remedy are in place and functioning as intended (see Table 5 and Appendix D). A recent Site visit indicated that restrictions on land use stipulated by the environmental covenant are being observed at the Site.

5.2. Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of Remedy Selection Still Valid?

The exposure assumptions made at the time of the 1988 ROD are still valid at the Site. (Appendix E). Government agencies are reevaluating the toxicity of hexavalent chromium. The State of California established an MCL for hexavalent chromium in 2014 (Appendix C). In addition, EPA's Integrated Risk Information System (IRIS) is now in the process of evaluating the toxicity of hexavalent chromium. Human health risk parameters for total chromium and hexavalent chromium may be revised in the future as a result of the IRIS toxicity evaluation and a federal MCL for hexavalent chromium may be established in the future.

The boundary of the 10 µg/L hexavalent chromium groundwater plume is undefined due to a lack of monitoring wells, and concentrations of hexavalent chromium greater than the State of California MCL (10 µg/L) have been detected in analytical sampling results collected from agricultural and domestic wells downgradient of the Site property. The full extent of the hexavalent chromium groundwater plume has not been defined, and there may be additional affected water supply wells.

The groundwater RAO is still valid, but it is not expected that RAOs will be met by operation of the current groundwater remedy. Success of the remedy cannot be assessed with the current network of monitoring wells. Existing monitoring wells are too shallow and too few to determine the current boundary of the hexavalent chromium plume. Analysis of recent trends generally indicate that total chromium and hexavalent chromium levels in groundwater have plateaued above the groundwater cleanup level of 50 µg/L (total chromium) and the new State of California MCL of 10 µg/L (hexavalent chromium) (Appendix B). Water levels in existing extraction wells are so low that they are impeding efficient operation of the ISB treatment system.

5.3. Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

No other information is available that calls into question the protectiveness of either the soil or groundwater remedies at the Site.

6. Issues/Recommendations

Table 10. Issues and Recommendations Identified in the Five-Year Review

Issues and Recommendations Identified in the Five-Year Review:				
Sitewide	**Issue Category: Institutional Controls**			
	Issue: The well development monitoring area established by 2013 ESD may not capture the entire area affected by the chromium groundwater plume.			
	Recommendation: Complete the ongoing Groundwater Plume Investigation; review 2013 ESD and issue a revision of the well development monitoring area if needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/28/2021
Sitewide	**Issue Category: Changed Site Conditions**			
	Issue: Declining water levels have impeded efficient operation of the groundwater remedy and prevented the collection of groundwater monitoring data. The off-property groundwater plume is undetermined.			
	Recommendation: Complete a Supplemental Remedial Investigation/Feasibility Study and propose a revised groundwater remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/28/2021
Sitewide	**Issue Category: Remedy Performance**			
	Issue: The migration of Site-related groundwater contamination has affected two residential potable water supply wells with unacceptable levels of chromium. Further, the extent of this groundwater contamination remains undefined and it is unknown whether other water supply wells in the area may be affected.			
	Recommendation: Complete the ongoing groundwater investigation to delineate the extent of Site-related groundwater contamination and continue to provide bottled drinking water to affected resident(s), as necessary, until onsite treatment systems are installed and operational.			

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	EPA	EPA	12/31/2018
Sitewide	**Issue Category: Changed Site Conditions**			
	Issue: Hexavalent chromium, as an individual contaminant, was not originally considered in the 1989 risk assessment.			
	Recommendation: Evaluate the State of California MCL for hexavalent chromium in public drinking water systems and consider if it should be incorporated in the Site groundwater cleanup level.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	12/31/2020

8. Protectiveness Statement

Table 11. Protectiveness Statement

Protectiveness Statement(s)	
Remedy: Sitewide	*Protectiveness Determination:* Protectiveness Deferred
Protectiveness Statement: A protectiveness determination of the remedy at the Selma Pressure Treating Company Superfund Site cannot be made at this time until further information is obtained. Further information will be obtained by completing the ongoing groundwater investigation to delineate the extent of Site-related groundwater contamination, continue efforts to identify and sample private wells within the plume, and provide bottled drinking water to affected resident(s), as necessary, until on-site treatment systems are installed and operational. It is expected that these actions will take approximately three to four years to complete, at which time a protectiveness determination will be made. In addition, for long-term protectiveness the following items need to be completed: • Extend the well development monitoring area to include the entire plume, once defined; • Evaluate State of California MCL for hexavalent chromium in public drinking water systems and consider in regard to the Site groundwater cleanup level.	

9. Next Review

The next Five-Year Review report for the Selma Pressure Treating Company Superfund Site is required five years from the completion date of this review.

Appendix A: List of Documents Reviewed

List of Documents Reviewed

CB&I. 2014. *Monitoring Well Sampling Report, November 2014, Selma Treating Company Superfund Site, Selma, California.* November.

CB&I. 2015a. *Monitoring Well Sampling Report, May 2015, Selma Treating Company Superfund Site, Selma, California.* May.

CB&I. 2015b. *Monitoring Well Sampling Report, October 2015, Selma Treating Company Superfund Site, Selma, California.* December.

CITY OF SELMA, CALIFORNIA. 2014. *City of Selma 2035 General Plan.* February. Accessed 4/20/2016 at http://www.cityofselma.com/PDFs/Web%20Site%20Applications/Comm%20Devlopment/2035%20General%20Plan.pdf

GEOMATRIX CONSULTANTS, INC. 2001. *First Five-Year review Report for Selma Pressure Treating Superfund Site, Selma, California*. July.

USACE. 2011. *Third Five-Year Review Report for Selma Treating Company Superfund Site, Selma, California.* September.

EPA. 1988. *Superfund Record of Decision, Selma Pressure Treating Company, CA, First Remedial Action – Final.* September.

EPA. 1993. *Selma Pressure Treating Company Superfund Site, Explanation of Significant Differences, OU1*. October.

EPA. 1997. *Selma Pressure Treating Company Superfund Site, Explanation of Significant Differences from 1988 Record of Decision*. April.

EPA. 2003. *Selma Pressure Treating Company Superfund Site, Record of Decision Amendment*. September.

EPA. 2004. *Remedial Action Report for Soils, Selma Pressure Treating Superfund Site.*

EPA. 2005a. *Selma Pressure Treating Company Superfund Site, Explanation of Significant Differences, OU2 Groundwater*. August.

EPA. 2005b. *Preliminary Close Out Report, Selma Pressure Treating Superfund Site, Selma, California.*

EPA. 2006. *Second Five-Year Review Report for Selma Pressure Treating Superfund Site, Selma, California.* September.

EPA. 2013. *Explanation of Significant Differences, OU2 Groundwater, Selma Pressure Treating Company Superfund Site, Selma, California.*

EPA. 2016. *Action Memorandum. Request for a Time-Critical Removal Action at the Selma Pressure Treating Company Superfund Site.* September.

Appendix B: Data Review

Data Review

1. Data reports reviewed

- Monitoring Well Sampling Reports dated Nov. 2014, May 2015, and Oct. 2015 (CB&I 2014, 2015a, and 2015b).
- Figure from CB&I summarizing extraction well hexavalent chromium trends during in-situ bioremediation (ISB) treatment from 2008 to 2016 (Figure B-8.)
- 2015 Remedial Action Optimization Study Report (Geosyntec Consultants, Inc., 2015).

2. Total and Hexavalent Chromium in Groundwater

The groundwater treatment technology in use at the Site is an in-situ bioremediation (ISB) treatment system. The ISB system extracts contaminated groundwater from downgradient, adds a substrate, and re-injects the water at an up-gradient location. This serves to set up groundwater circulation loops and stimulates endogenous biological activity in the groundwater and surrounding geological formation, creating zones of reductive conditions. Chromium in the groundwater is reduced from the more mobile and toxic hexavalent form to the less mobile and less toxic trivalent form.

The uppermost water-bearing unit of the aquifer at the Site was divided into three zones based on the degree of stratification of groundwater flow and contaminant transport: a shallow zone from about 20 to 50 feet below ground surface (bgs), an intermediate zone from about 45 to 75 feet bgs, and a deep zone from about 75 to 120 feet bgs.

ISB treatment of groundwater has proceeded in phases (Figure B-1). ISB Phase 1 is located on the southeast portion of the Site. Phase 2A is immediately south of the Site. Phase 2B is south of the Site between the Phase 2A area and Highway 99. Phase 3 is located at and immediately adjacent to Highway 99. Phase 3B (not shown in Figure B-1) is located across Highway 99 from the Site and immediately southwest of Phase 3.

The cleanup level for total chromium in groundwater listed in the 1988 ROD is 50 micrograms per liter (µg/L) and the cleanup level for arsenic in groundwater is listed at 50 µg/L. There was no groundwater cleanup level for hexavalent chromium in the 1988 ROD. The State of California has recently adopted an MCL for arsenic and hexavalent chromium in groundwater of 10 µg/L 50 µg/L for total chromium. Current cleanup levels for the Site are summarized in Table B-1.

Table B-1. Groundwater Cleanup Levels and MCLs

COC	1988 ROD Groundwater Cleanup Levels	2014 California MCL	Current Federal MCL
Chromium (total)	50	50	100
Chromium (hexavalent)	Not specified; no state or Federal MCL in 1988	10	no Federal MCL
Arsenic	50	10	10

Note: all values in µg/L.

There is a hydraulic gradient at the Site moving from higher groundwater elevation in the northeast to lower groundwater elevation in the southwest. Average groundwater levels at the Site have fallen several feet since beginning of ISB treatment due to region-wide drought conditions. Table B-2 summarizes the recent drop in water level observed in monitoring wells during the period May 2014 to October 2015. As of the groundwater sampling event of October 2015, many of the monitoring wells have gone dry. Table B-3 summarizes wells that were observed to have gone dry during the period November 2014 to October 2015. Table B-4 summarizes all wells that have historically observed to have gone dry due to the decline in water levels. A majority of these observations (25 of 42) have occurred over the past 5 years of monitoring. Locations of groundwater wells, groundwater elevation contours, and groundwater plume location can be seen in Figures B-2, B-3, and B-4 through B-5 respectively.

Table B-2. Decreases in Water Level Elevation, May 2014 – October 2015

Well ID	Change in Water Level Elevation (feet)	Period over Which Decrease in Water Level Elevation Occurred
Intermediate Zone Wells		
SE-1I	-6.15	May 2014 – November 2014
RA-5B	-7.94	May 2014 – May 2015
Deep Zone Wells		
P2D	-5.96	May 2014 – November 2014
P6D	-5.28	May 2014 – November 2014
P6D	-2.37	November 2014 – May 2015
P6D	-5.57	May 2015 – October 2015
P15D	-6.05	May 2014 – November 2014
P15D	-1.58	November 2014 – May 2015
P15D	-6.00	May 2015 – October 2015
SE-1D	-6.04	May 2014 – November 2014
SE-1D	-1.80	November 2014 – May 2015
SE-1D	-6.03	May 2015 – October 2015
RA6	-8.00	May 2014 – May 2015
RA-7	-8.04	May 2014 – May 2015

Note: water elevation data is from groundwater monitoring reports for November 2014 (CB&I, 2014), May 2015 (CB&I, 2015a), and October 2015 (CB&I, 2015b).

Table B-3. Wells That Have Gone Dry, November 2014 – October 2015

Well ID	Date(s) That Wells Were Observed Without Sufficient Water for Sampling	Reference Elevation of Bottom of Well (feet MSL)
Shallow Zone Wells		
P6S	November 2014, May 2015, October 2015	261.8
SE1S	November 2014, May 2015, October 2015	244.5
SE-4S	November 2014, May 2015, October 2015	253.8
SE-6S	November 2014, May 2015, October 2015	252.7
R25	November 2014, October 2015	261.9
Intermediate Zone Wells		
P2I	November 2014, May 2015, October 2015	244.5
P6I	November 2014, May 2015, October 2015	242.5
P11I	May 2015	243.2
P15I-2	November 2014	246.7
P16I	November 2014, May 2015, October 2015	246.4
R23I	May 2015	244.9
R24I	November 2014, May 2015, October 2015	243.1
RA-1	May 2015	238.3
RA-2	May 2015	237.1
RA-3	May 2015	236.4
RA-4	May 2015	236.0
RA-5A	May 2015	235.2
SE-1I	October 2015	228.9
Extraction Wells		
EW-1	November 2014, May 2015	238.9
EW-1A	November 2014	242.0
EW-2	November 2014, May 2015	252.1
EW-3A	May 2014, November 2014	?
EW-4	May 2014, November 2014	?
EW-5	May 2014	?
EW-6	May 2014, November 2014	?
EW-7	May 2014	211.8
EW/EIW-13	May 2014	?
EW/EIW-14	May 2014	?
EW/EIW-15	May 2014	?

Notes: MSL = mean sea level
? = Unknown

Table B-4. Wells That Have Gone Dry per Historical Well Data in the October 2015 Monitoring Well Sampling Report (CB&I, 2015)

Well ID	Date(s) That Wells Were Observed Without Sufficient Water for Sampling	Reference Elevation of Bottom of Well (feet MSL)
Shallow Zone Wells		
P1S	December 1997	?
P4S	July 2002	262.5
P6S	April 2002	261.8
P8S	April 2002	263.2
P9S	July 2002	260.2
R23S	July 2002	263.4
SE-1S	November 2013	244.7
SE-2S	July 2008	251.6
SE-3S	July 2008	251.6
SE-4S	July 2008	253.8
SE-6S	July 2008	252.7
UR-15	April 2002	265.5
UR-24	July 2004	257.0
R21	November 2002	261.9
R22	April 2002	266.7
R24	November 2002	262.0
R25	April 2002	261.9
Intermediate Zone Wells		
P2I	November 2013	244.5
P6I	November 2013	242.5
P11I	May 2014	243.2
P15I-2	November 2013	246.7
P16I	November 2013	246.4
R23I	May 2014	244.9
R24I	May 2013	243.1
RA-1	May 2015	238.3
RA-2	May 2015	237.1
RA-3	May 2015	236.4
RA-4	May 2015	236.0
RA-5A	May 2015	235.5
SE-1I	October 2015	228.9
Extraction Wells		
EW-1	November 2014, May 2015	238.9
EW-1A	November 2014	242.0
EW-2	November 2014, May 2015	252.1
EW-2A	May 2010	243.6
EW-3A	May 2014, November 2014	?
EW-4	May 2014, November 2014	?
EW-5	May 2014	?
EW-6	May 2014, November 2014	?
EW-7	May 2014	211.8
EW/EIW-13	May 2014	?
EW/EIW-14	May 2014	?
EW/EIW-15	May 2014	?

Notes: MSL = mean sea level
? = Unknown

Comparison of the groundwater plume map from 2010 (Figure B-5) with the groundwater plume map from 2015 (Figure B-6), implies that the hexavalent chromium plume in the deep zone has migrated further to the southwest. Figure B-4 and Figure B-5 depict the edge of the plume where the chromium concentrations are 50 µg/L; groundwater with chromium at or above the California MCL of 10 µg/L likely extends over a larger area. The southwest portion of the plume edge at 10 µg/L cannot be defined due to the lack of monitoring wells in this area.

Geosyntec performed statistical trend analysis (Mann-Kendall trend analysis) for groundwater hexavalent chromium concentrations (Geosyntec Consultants, Inc. 2015). Summaries of these analyses can be found in Tables B-5, B-7, and B-9.

At four private wells downgradient of the extraction wells, contamination levels, as measured in 2007 to 2013, appear to be increasing or stable (Table B-5). The average hexavalent chromium concentration is above the Site cleanup level in three of the wells; average hexavalent chromium concentration is above the new California MCL in all four wells.

Table B-5. Hexavalent Chromium Trend Analysis Summary – Private Wells Downgradient of Extraction Well Network

	Well ID:			
	S-11	**IW-7**	**IW-16**	**S-10**
# of data points	16	16	15	16
# of exceedances above 50 µg/L	5	4	9	0
# of exceedances above 10 µg/L	16	16	15	5
Average Hexavalent Chromium Concentration (µg/L)	*44.7*	*44.1*	**62.1**	*10.3*
Trend (Mann-Kendall Analysis)	Probably Increasing	No Trend	Increasing	Stable

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from March 2007 to November 2013.

Table B-6. Hexavalent Chromium Concentrations – Private Wells Downgradient of Extraction Well Network

	Well ID:			
Sample date:	**S-11**	**IW-7**	**IW-16**	**S-10**
3/1/2007	*29.6*	*31.3*	*46.7*	*11.6*
7/1/2007	*30.3*	*41.6*	*43.4*	7.68
11/1/2007	*39*	**105**	*62*	9.44
3/1/2008	*48.8*	*47.7*	**73.1**	*30.8*
8/1/2008	*47.8*	*39.8*	*33*	7.91
1/1/2009	*47.1*	*35.5*	**65.7**	5
7/1/2009	*45.3*	*23*	*37.5*	5
11/1/2009	*40.8*	*14*	*42*	5
5/1/2010	**65.2**	**59.5**	**77.8**	5
11/1/2010	**59.3**	*42.4*	**72.8**	5
6/1/2011	**53.4**	**74.6**	*44.7*	*11*
11/1/2011	*10*	*10*	NS	5
5/1/2012	**56.7**	*23.3*	**72.9**	*28.2*
11/1/2012	*44.6*	**72.4**	**104**	9.32
5/1/2013	**55.8**	*38.8*	NS	5
11/1/2013	*42*	*47.2*	**93.7**	*13.1*

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from March 2007 to November 2013
- NS = not sampled.

At seven monitoring wells that historically exhibit the highest concentrations of hexavalent chromium, only one exhibited a downward trend (SE-1D) (Table B-7). These wells are located on the Site or immediately to the southwest on both sides of highway 99. One exhibited an increasing trend (P15D), and the remaining five were stable or showed no trend. The average hexavalent chromium concentration is above the new California MCL in all but one of these wells (MW-6I).

Table B-7. Hexavalent Chromium Trend Analysis Summary – Historically Impacted Wells

	Phase and Well ID:						
	Phase 2B		Phase 3			Phase 1	
	MW-6D	MW-6I	P15D	P15I-2	R24I	SE-1I	SE-1D
# of data points	16	12	16	10	13	16	16
# of exceedances above 50 µg/L	3	0	0	6	5	6	1
# of exceedances above 10 µg/L	15	3	5	10	11	12	13
Average Hexavalent Chromium Concentration (µg/L)	*36.9*	8.1	*11.1*	**62.8**	**52.5**	**59.0**	*26.4*
Trend (Mann-Kendall Analysis)	Stable	Stable	Increasing	No Trend	No Trend	No Trend	Decreasing

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from March 2007 to November 2013.

Table B-8. Hexavalent Chromium Concentrations – Historically Impacted Wells

	Phase and Well ID:						
	Phase 2B		Phase 3			Phase 1	
Sample date:	MW-6D	MW-6I	P15D	P15I-2	R24I	SE-1I	SE-1D
1-Mar-07	**53.4**	*11.5*	5	*21.9*	*18.4*	**50.1**	*14*
1-Jul-07	**50.7**	5	5	*41*	7.99	*26.3*	*40.8*
1-Nov-07	**50.9**	9.18	5.37	**85.7**	**138**	*49.5*	**53.9**
1-Mar-08	*37.6*	5	5.88	**85.8**	**52.8**	8.9	*36.1*
1-Jul-08	*38.1*	5	5	**106**	*25*	*15.4*	*40.7*
1-Jan-09	*33.2*	5	5	**85.2**	*33.8*	**74.2**	*40.4*
1-Jul-09	*35.2*	5	7.58	NS	5.4	**66.3**	*38.9*
1-Nov-09	*33.9*	NS	5	NS	**119**	**135**	*25.1*
1-May-10	*21.1*	NS	5	NS	NS	**160**	*21*
1-Nov-10	5	*10.9*	5.33	NS	**93.1**	5	9.19
1-Jun-11	*28.8*	5	6.4	NS	*40.3*	*34*	*10.7*
1-Nov-11	*38.5*	5	*15.2*	*35*	*38.5*	*18.2*	5
1-May-12	*41.3*	5	*28.2*	*48.5*	*44.7*	5	*48.1*
1-Nov-12	*40*	*25.4*	*32.4*	**52.1**	**65.2**	6.44	*12*
1-May-13	*45.7*	NS	*18.7*	**66.9**	NS	*15.3*	9.57
1-Nov-13	*37.3*	NS	*22.7*	NS	NS	**274**	*16.5*

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from March 2007 to November 2013
- NS = not sampled.

At the five Phase 3B extraction wells for the period from May 2011 to July 2014, four showed a downward trend (Table B-9). These wells are all offsite across Highway 99 and are located further to the southwest of the Site. The remaining well (EW-7) was stable. The average hexavalent chromium concentration is at least four times above the new California MCL in all of these wells. The average hexavalent chromium concentration is above the cleanup level of 50 µg/L in four of the five extraction wells. While most of these wells had a trend of declining contaminant concentration over this period, it not expected that levels will drop below the new California MCL without changes to the design or operation of the treatment system.

Table B-9. Hexavalent Chromium Trend Analysis Summary – Phase 3B Extraction Wells May 2011 to July 2014

	Well ID:				
	EW-3A	**EW-4**	**EW-6**	**EW-5**	**EW-7**
# of data points	36	39	39	37	14
# of exceedances above 50 µg/L	22	39	16	35	13
# of exceedances above 10 µg/L	35	39	39	37	14
Average Hexavalent Chromium Concentration (µg/L)	**66.9**	**72.6**	*41.8*	**129.5**	**55.7**
Trend (Mann-Kendall Analysis)	Decreasing	Decreasing	Decreasing	Decreasing	Stable

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from May 2011 to July 2014.

Table B-10. Hexavalent Chromium Concentrations – Phase 3B Extraction Wells May 2011 to July 2014

	Well ID:				
Sample date:	**EW-3A**	**EW-4**	**EW-6**	**EW-5**	**EW-7**
31-May-11	**100**	**80**	**50**	**140**	NS
30-Jun-11	**100**	**80**	**50**	**150**	NS
27-Jul-11	**100**	**80**	**50**	**140**	NS
30-Aug-11	*40*	**80**	**50**	**150**	NS
28-Sep-11	**100**	**80**	**50**	**140**	NS
26-Oct-11	**100**	**80**	**50**	**140**	NS
30-Nov-11	**100**	**90**	**60**	**140**	NS
28-Dec-11	**90**	**80**	*40*	**140**	NS
31-Jan-12	**90**	**80**	*40*	**140**	NS
28-Feb-12	**90**	**80**	*40*	**140**	NS
28-Mar-12	**90**	**80**	*40*	**130**	NS
25-Apr-12	**90**	**80**	*40*	**140**	NS

	Well ID:				
Sample date:	**EW-3A**	**EW-4**	**EW-6**	**EW-5**	**EW-7**
31-May-12	**90**	**80**	*40*	**140**	NS
27-Jun-12	**70**	**80**	**50**	NS	NS
31-Jul-12	*40*	**80**	**50**	**150**	NS
29-Aug-12	*40*	**80**	**50**	**150**	NS
26-Sep-12	*40*	**80**	**50**	**150**	NS
31-Oct-12	*40*	**80**	**50**	**150**	NS
28-Nov-12	**70**	**70**	**50**	**150**	NS
27-Dec-12	*10*	**70**	*40*	**130**	NS
29-Jan-13	*30*	**60**	*40*	**140**	NS
27-Feb-13	*30*	**60**	*40*	**140**	NS
28-Mar-13	*30*	**60**	*20*	NS	NS
5-Apr-13	*30*	**60**	*20*	**140**	**90**
30-Apr-13	*30*	**60**	*40*	**120**	**60**
29-May-13	*30*	**60**	*40*	**120**	**50**
28-Jun-13	*40*	**60**	*30*	**140**	**50**
29-Jul-13	*40*	**60**	*30*	**140**	**50**
29-Aug-13	NS	**60**	*30*	**130**	*40*
30-Sep-13	**90**	**70**	*30*	**130**	**50**
30-Oct-13	**80**	**60**	*30*	**120**	**50**
29-Nov-13	**90**	**70**	*40*	**130**	**70**
30-Dec-13	**90**	**70**	*30*	**130**	**50**
31-Jan-14	**90**	**70**	*40*	*40*	**50**
24-Feb-14	**50**	**70**	*30*	**90**	**70**
28-Mar-14	**90**	**70**	**60**	**60**	**50**
30-Apr-14	**80**	**80**	**50**	*40*	**50**
30-Jun-14	NS	**70**	**50**	**150**	NS
31-Jul-14	NS	**70**	*40*	**120**	NS

Notes:

- The new California MCL for hexavalent chromium is 10 µg/L; exceedances of this level are italicized.
- The cleanup level for total chromium is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from May 2011 to July 2014
- NS = not sampled.

Trends of hexavalent chromium concentrations from 2008 to 2016 in ISB extraction wells are depicted in Figure B-6. In the first years since the beginning of ISB Phase 3, hexavalent chromium concentrations at all wells declined. For the most recent years of data, the concentration of hexavalent chromium either

stayed flat or dropped very slowly. The 2015 Remedial Action Optimization Report noted that the ISB remedy has been somewhat effective in reducing the mass of hexavalent chromium contamination, but that average concentrations still do not meet the Site groundwater cleanup levels or the current California MCL for hexavalent chromium.

In order to mitigate the decline in groundwater levels at the Site, it is recommended that deeper wells be developed to facilitate future monitoring of groundwater. A sufficient number of additional wells further to the southwest of the Site should be constructed in order to delineate the boundary of the hexavalent chromium plume for the new MCL concentration of 10 µg/L.

3. Arsenic in Groundwater

Arsenic at the Site is thought to be naturally occurring in the aquifer soil matrix and mobilized into groundwater under the reductive conditions created by the ISB treatment. Arsenic mobilization was noted during the first phase of ISB treatment and was attributed to an excess of substrate being used, which caused excessively reductive conditions in groundwater. A lower concentration of substrate has been used during subsequent ISB phases to create less reductive conditions and thereby prevent excessive arsenic mobilization.

The cleanup level for arsenic listed in the 1988 ROD is 50 µg/L. The current California and Federal MCLs for arsenic are 10 µg/L. No samples taken in the past five years have exceeded the ROD cleanup level for arsenic. Twenty-two of seventy detections of arsenic have exceeded the MCL. Across all wells sampled, arsenic has been detected on average at just under the MCL. Table B-11 contains a summary of arsenic data for the past five years. Table B-12 contains all arsenic sample results for the past five years.

Table B-11: Summary of Arsenic Data – May 2010 to May 2015

Sample Date:	Number of Exceedances Above 10 µg/L	Number of Arsenic Detections	Average	Highest Detection
May-15	1	5	7.3	*15.9*
Nov-14	0	1	5	5
May-14	3	9	*10.09*	*13.9*
Nov-13	0	2	5	5
May-13	6	15	8.9	*20.5*
May-12	5	17	8.2	*20.1*
Jun-11	3	9	8.8	*18.8*
May-10	4	12	9.3	*21.3*

Notes:

- The California and Federal MCLs for arsenic are both 10 µg/L; exceedances of this level are italicized.
- The cleanup level for arsenic is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from May 2010 to May 2015.

Wells RA-1, R23I, RA-5A are located in the ISB Phase 1 area; wells EW-1, RA-4, EW-1A, and RA-7 are located immediately adjacent and downgradient in the ISB Phase 2A area. Arsenic mobilization was noted originally in these wells; monitoring of arsenic has continued in order to monitor arsenic levels after a reduction was made to the concentration of substrate being injected during Phase 1. Arsenic levels appear to be elevated above the MCL in some cases, but well below the Site cleanup level of 50 µg/L.

Monitoring for arsenic has been conducted beneath the onsite soil repository (well P16I), at the Phase 2B area (well P2D), and at downgradient residential wells (P11I, P11D, S-11). Detections during the past five years at all these locations have been at half or less than the MCL for arsenic. This pattern is consistent with the thought that arsenic detected at the Phase I area wells are due to naturally occurring arsenic being mobilized by ISB treatment.

Table B-12: Arsenic Concentrations – All Detections May 2010 to May 2015

Sample date:	Well ID:	Arsenic concentration
May-15	S-11	5
May-15	P11D	5
May-15	RA-5B	5
May-15	RA-6	5.58
May-15	RA-7	*15.9*
Nov-14	S-11	5
May-14	S-11	5
May-14	P11D	5
May-14	RA-1	*13.9*
May-14	RA-2	5.2
May-14	RA-3	6.39
May-14	RA-4	31
May-14	RA-5B	5
May-14	RA-6	5.32
May-14	RA-7	*14*
Nov-13	S-11	5
Nov-13	P16I	5
May-13	S-11	5
May-13	EW-1	*13*
May-13	EW-1A	*14*
May-13	EW-7	5
May-13	P11D	5
May-13	P16I	5
May-13	R23I	*10.7*
May-13	RA-1	5
May-13	RA-2	5

Sample date:	Well ID:	Arsenic concentration
May-13	RA-3	5
May-13	RA-4	*18.1*
May-13	RA-5A	*20.5*
May-13	RA-5B	5
May-13	RA-6	5.32
May-13	RA-7	*11.7*
May-12	S-11	5
May-12	EW-1	*13*
May-12	EW-1A	5
May-12	EW-2	5
May-12	EW-7	5
May-12	IW-16	5
May-12	P11D	5
May-12	P11I	5
May-12	R23I	*20.1*
May-12	RA-1	5.25
May-12	RA-2	5
May-12	RA-3	5
May-12	RA-4	*15.7*
May-12	RA-5A	*17.3*
May-12	RA-5B	5
May-12	RA-6	6.55
May-12	RA-7	*11.5*
Jun-11	S-11	5
Jun-11	EW-1	5
Jun-11	EW-1A	*14*
Jun-11	P11D	5
Jun-11	R23I	*18.8*
Jun-11	RA-1	5
Jun-11	RA-2	5
Jun-11	RA-3	5
Jun-11	RA-4	*16.5*
May-10	EW-1	3.04
May-10	EW-1A	*16.3*
May-10	P11D	5
May-10	P2D	5
May-10	RA-1	6.22
May-10	RA-2	4.98
May-10	RA-3	5
May-10	RA-4	*16.2*

Sample date:	Well ID:	Arsenic concentration
May-10	RA-5A	*21.3*
May-10	RA-5B	5
May-10	RA-6	7.4
May-10	RA-7	*15.8*

Notes:

- The California and Federal MCLs for arsenic are both 10 µg/L; exceedances of this level are italicized.
- The cleanup level for arsenic is 50 µg/L; exceedances of this level are in bold type.
- All values in micrograms per liter (µg/L).
- Data was collected from May 2010 to May 2015.

4. Data Review Figures

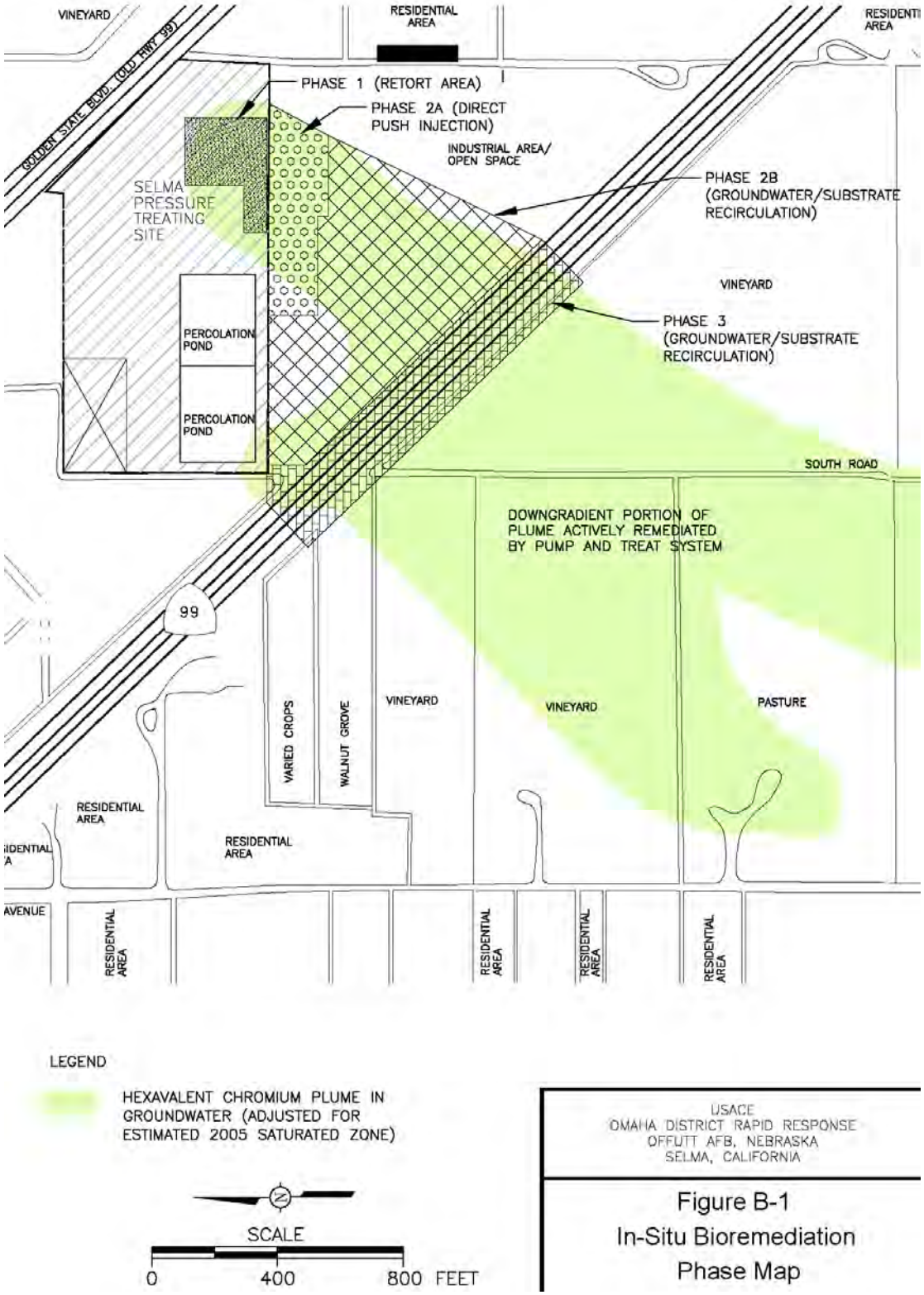


Figure B-1. In-Situ Bioremediation Phase Map

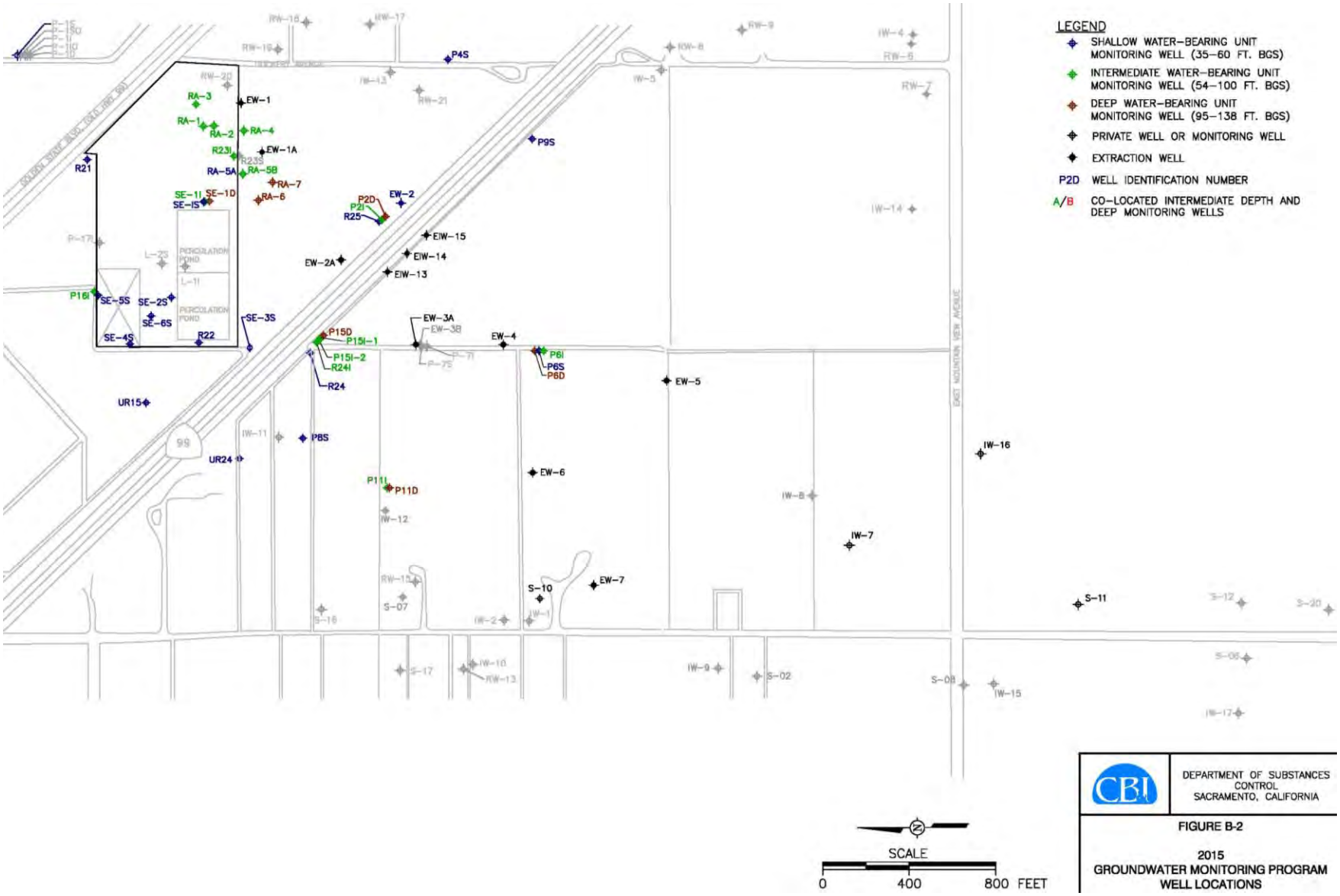


Figure B-2. 2015 Groundwater Monitoring Program Well Locations

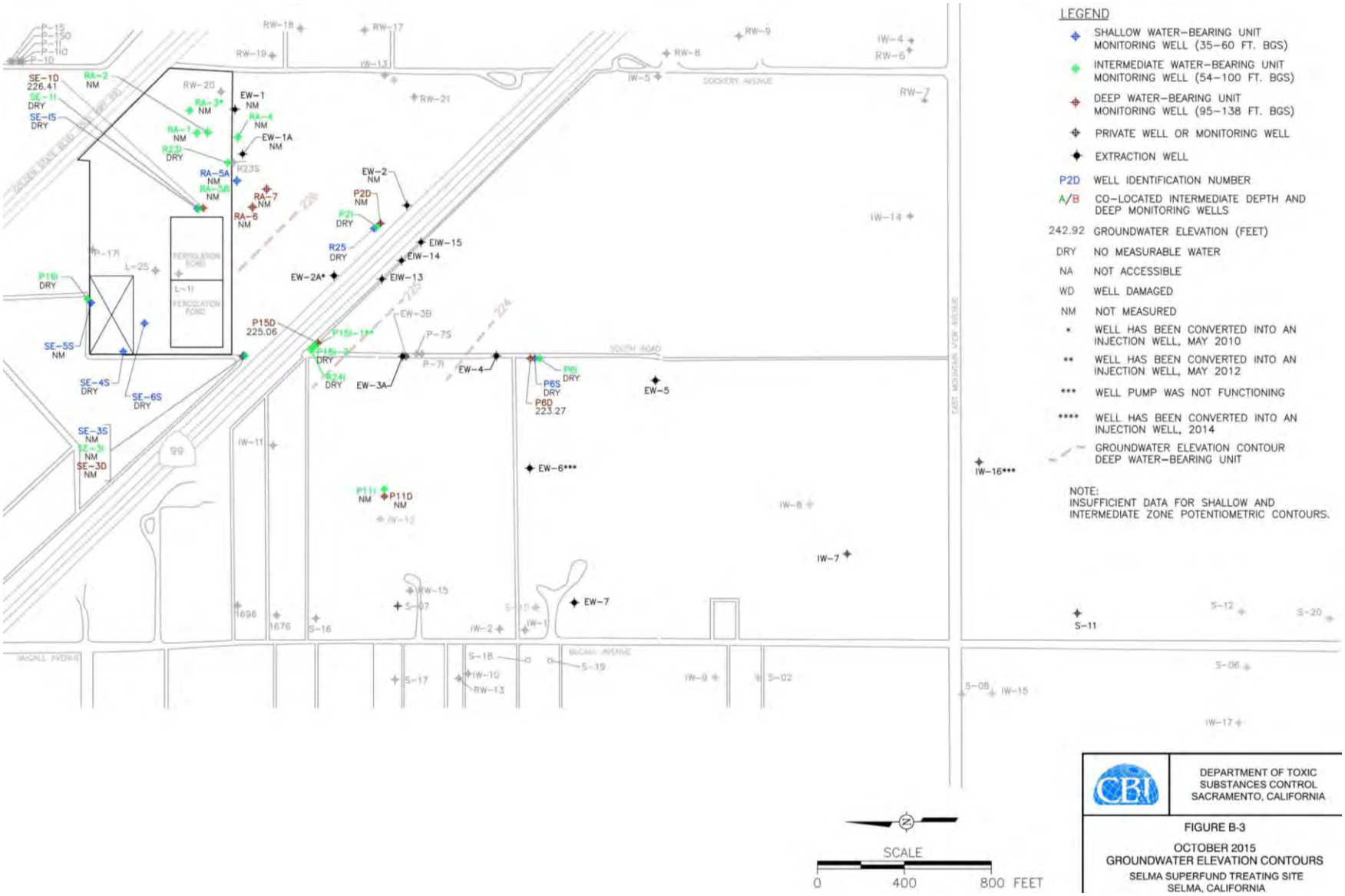


Figure B-3. October 2015 Groundwater Elevation Contours

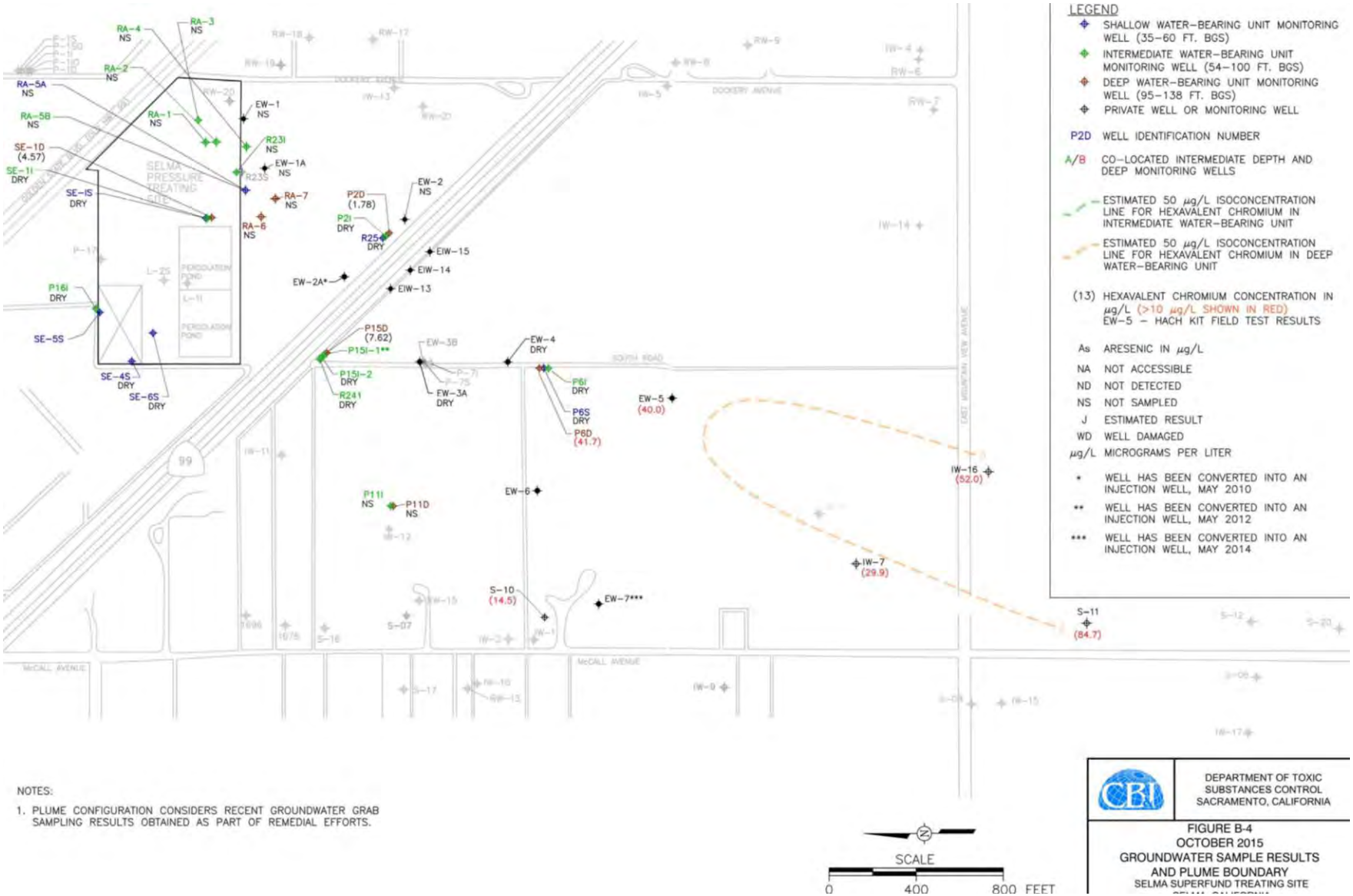
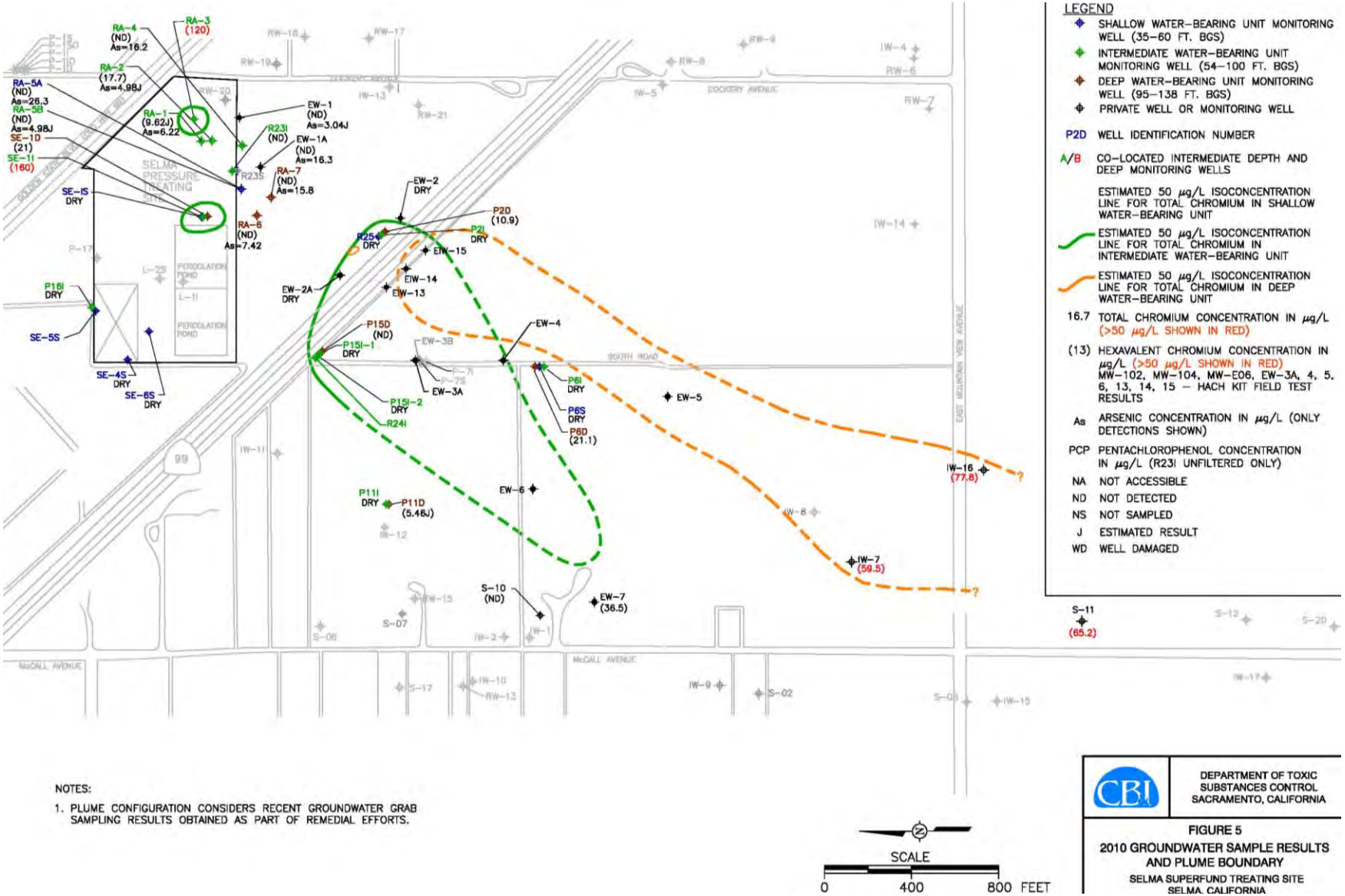


Figure B-4. October 2015 Groundwater Sample Results and Plume Boundary



NOTES:

1. PLUME CONFIGURATION CONSIDERS RECENT GROUNDWATER GRAB SAMPLING RESULTS OBTAINED AS PART OF REMEDIAL EFFORTS.

Figure B-5. 2010 Groundwater Sample Results and Plume Boundary

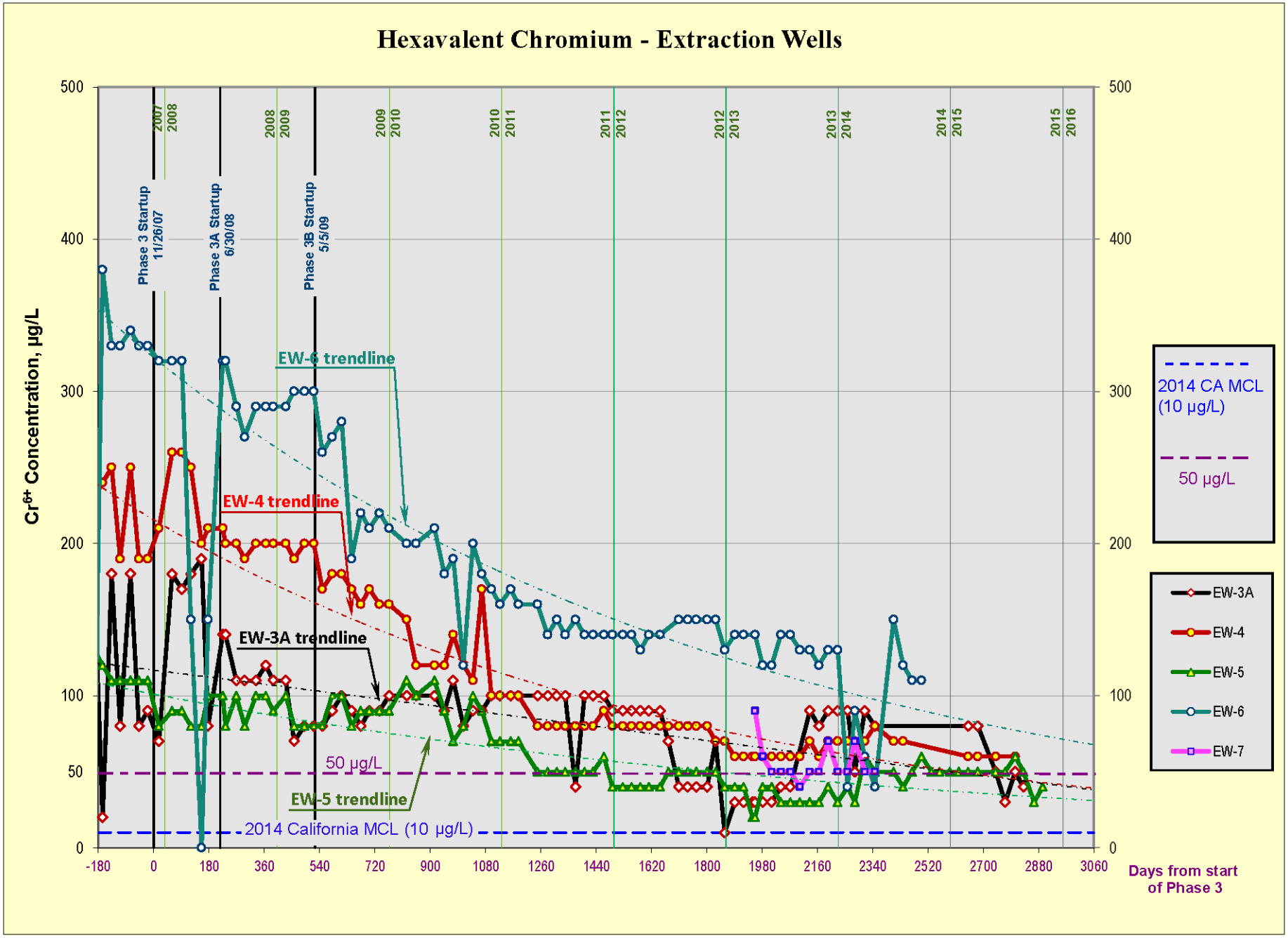


Figure B-6. Phase 3B Extraction Wells Hexavalent Chromium Trends

Appendix C: ARAR Assessment

ARAR Assessment

Section 121 (d)(2)(A) of CERCLA specifies that Superfund remedial actions must meet any Federal standards, requirements, criteria, or limitations that are determined to be legally Applicable or Relevant and Appropriate Requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

Chemical-specific ARARs identified in the selected remedy within the 1988 ROD and subsequent ROD Amendments for the groundwater at this Site and considered for this FYR for continued groundwater treatment, are shown in Table C-1. Contaminants with cleanup levels that exceed their current Maximum Contaminant Level (MCL) are highlighted in light green below.

Table C-1. Summary of Groundwater ARAR Changes

Contaminants of Concern	1988 ROD cleanup levels (µg/L)	California MCL (µg/L)	Federal MCL (µg/L)	Is the cleanup level above the current MCL?
Arsenic*	50	10	10	Yes
Chromium (Total)	50	50	100	No
Hexavalent Chromium**	n/a	10	n/a	Yes
Pentachlorophenol***	n/a	1	1	No

*Federal MCL for Arsenic lowered to 10 µg/L in 1996
**California MCL for hexavalent chromium was established in 2014
***ESD1 added new MCL of 1 µg/L for Pentachlorophenol in 1993

Two compounds have cleanup levels that are above their respective current MCL: arsenic, and hexavalent chromium. Concentrations of arsenic above the current MCL have become mobilized as a result of in-situ bioremediation of the groundwater chromium plume near the Site.

Arsenic in groundwater at the site in the past five years has regularly been below the Federal MCL of 10 µg/L. Because levels of arsenic in groundwater are below the MCL of 10 µg/L, the site cleanup level of 50 µg/L for arsenic remains protective.

A cleanup level for pentachlorophenol (PCP) in groundwater was established in response to establishment of a federal MCL for PCP. However, PCP has never been detected in groundwater at the Site. No exposure to PCP via groundwater is occurring at the site; the site cleanup level of 1 µg/L as established in ESD #1 is protective.

There has been one revision to laws or regulations that affects the protectiveness of the remedy: the State of California established an MCL for hexavalent chromium in July 2014 (Table C-2). Due to the establishment of the state MCL for hexavalent chromium, the ROD cleanup level for total chromium may not be protective. The footprint of the groundwater plume requiring

treatment for the hexavalent form of chromium will need to be expanded. Additional work to characterize the boundary of the groundwater plume exceeding this MCL is underway.

Table C-2. Evaluation of ARARs amended since the last FYR

REQUIREMENT AND CITATION	DOCUMENT	DESCRIPTION	EFFECT ON PROTECTIVENESS	COMMENTS	AMENDMENT DATE
California Safe Drinking Water and Toxic Enforcement Act. California HSC §116270 et seq.	1988 ROD	California MCLs	The establishment of an MCL for hexavalent chromium will likely expand the groundwater plume area that needs to be addressed by cleanup actions. Work is underway as of the writing of this FYR to define the boundary of the groundwater plume that exceeds the new MCL for hexavalent chromium.	This chemical-specific ARAR is applied as the aquifer cleanup level as well as the treatment discharge requirement	7/1/2014. California MCL for Hexavalent Chromium established

The following ARARs have not changed since the last Five Year Review; and therefore, do not affect protectiveness:

- Safe Drinking Water Act 42 U. S. C. §300f et seq.; 40 CFR Part 141
- Safe Drinking Water Act 42 U. S. C. §1424(e).
- Occupational Safety and Health Act. 29 U. S. C. §651 et seq.; 40 CFR Part 300.150
- 22 CCR §66261 (Identification and Listing of Hazardous Waste)
- 22 CCR §66262 et seq. (Standards Applicable to Generators of Hazardous Waste)
- 22 CCR §66264.90 through 66264.101 (Water Quality Monitoring and Response Programs for Permitted Facilities)
- 22 CCR §66264.110 through 66264.120 (Closure and Post-Closure)
- 22 CCR §66264.310 (Closure and Post-Closure Care)
- California Air Resources Act. California HSC §39000 et seq.
- Porter Cologne Water Quality Control Act. California Water Code §13000 et seq.
- California "Superfund" Law – Hazardous Substance Account Act/Hazardous substances Cleanup Bond Act. California HSC §25300
- California Occupational Safety and Health Act. California Labor Code §6300 et seq.
- San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Regulation VIII – Fugitive PM10 Prohibitions
- SJVUAPCD Rule 4101

- SJVUAPCD Rule 4201
- SJVUAPCD Rule 4202
- SJVUAPCD Rule 8021

Appendix D: Copy of Environmental Covenant

RECORDING REQUESTED BY:

Selma Leasing Company, Inc.
1450 East Front Street
Selma, California 93662-9782

WHEN RECORDED, MAIL TO:

Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826

FRESNO County Recorder
Robert C. Werner
DOC- 2006-0129984
Thursday, JUN 22, 2006 09:00:00
Ttl Pd $0.00 Nbr-0002215945
RGR/R4/1-22

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

COVENANT TO RESTRICT USE OF PROPERTY
ENVIRONMENTAL RESTRICTION

(California Civil Code Section 1471(c))

(Re: Fresno County Assessors Parcel Number (APN) 39-011-057 and Assessors Parcel Number 39-011-059)

This Covenant and Agreement ("Covenant") is made by and between Selma Leasing Company, Inc. (the "Covenantor"), the current owner of property just south of the city of Selma, County of Fresno, State of California, described in Exhibit "A", attached hereto and incorporated herein by this reference (the "Property"), and the Department of Toxic Substances Control (the "Department"). Pursuant to California Civil Code Section 1471(c), the Department has determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials as defined in California Health and Safety Code (H&SC) section 25260. The Covenantor and the Department, collectively referred to as the "Parties", therefore intend that the use of the Property be restricted as set forth in this Covenant. The Parties further intend that the provisions of this covenant also be

for the benefit of, and be enforceable by, the U.S. Environmental Protection Agency (the "U.S. EPA") as a third party beneficiary.

ARTICLE I
STATEMENT OF FACTS

1.01. The Property, totaling approximately 14 acres, is more particularly described and depicted in Exhibit "A", attached hereto and incorporated herein by this reference. The Property is commonly designated as county assessor parcel numbers 390-110-59 and 390-110-57. The Property is bounded by an industrial area to the North, Golden State Boulevard on the East, a materials recycling transfer facility to the South, and by highway (route 99) to the West. The Property is also described in the official records of Fresno County in Book 5911, Page 466, Document number 53015 and Book 6168, Page 210, Document number 48222. The Property is located within Section 8, of Township 16 South, Range 22 East relative to the Mount Diablo Base and Meridian.

1.02. Hazardous substances, as defined in section 25316, Chapter 6.8, Division 20 of the California H&SC Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C Section 9601(14) (1998); and 40 Code of Federal Regulations parts 261.3 and 302.4 (1997), remain on portions of the Property. The hazardous substances of concern are arsenic, chromium, hexavalent chromium, pentachlorophenol, dioxins, furans and trichlorophenols in soil and arsenic, chromium, and hexavalent chromium in groundwater. These substances are also hazardous materials as defined in H&SC Section 25260.

1.03. The Property is being remediated pursuant to a Record of Decision, as amended, (ROD) for the Selma Pressure Treating Superfund Site issued by the U.S. EPA, dated September 1991. Also associated with the ROD are an Explanation of

Significant Differences issued on December 9, 1993 and Amendment #1 to the Record of Decision dated September 2003. Under the ROD, the U.S. EPA selected a final remedial action for the property pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. Sec. 9601 et seq. The Department concurred with this remedy.

1.04. The Property is the location of a Soil Impoundment Cell, a RCRA Asphalt Cap, and a Groundwater Pump and Treatment System (all wells, pumps, piping, recharge (percolation) ponds, and electrical, and treatment systems required to treat groundwater). The Soil Impoundment Cell and RCRA Asphalt Cap were constructed to minimize the mobility of contaminants and limit human contact with those contaminants. The Groundwater Pump and Treatment System was installed onsite to control and remediate groundwater beneath the Property. A diagram depicting the approximate location of the Soil Impoundment Cell, RCRA Asphalt Cap, and Groundwater Pump and Treatment System is included in Exhibit "B" attached hereto and incorporated herein by this reference.

The ROD provides for a deed restriction limiting the future use of the Property to industrial/commercial uses only. A deed restriction is necessary to preclude potential residential user's exposure to hazardous substances which remain at the Property, to preclude disruption of contaminated soils, and to limit potential exposure to hazardous substances identified in the soil and groundwater beneath the Property.

ARTICLE II
DEFINITIONS

2.01. Department. "Department" means the California Department of Toxic Substances Control and includes its successor agencies, if any.

2.02. U.S. EPA. "U.S. EPA" means the United States Environmental Protection Agency and includes its successor agencies, if any.

2.03. Owner. "Owner" means the Covenantor, its successors in interest, and their successors in interest, including heirs and assigns, who at any time hold title or an ownership interest to all or any portion of the Property.

2.04. Occupant. "Occupant" means any Owner and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Property.

2.05. CERCLA Lead Agency. "CERCLA Lead Agency" means the governmental entity having the designated lead responsibility to implement response action under the National Contingency Plan ("NCP"), 40 C.F.R. Part 300. U.S. EPA or a state agency acting pursuant to a contract or cooperative agreement executed under CERCLA Section 104(d)(1), 42 U.S.C. Section 9604(d)(1), or designated pursuant to a CERCLA Memorandum of Agreement entered into under subpart F of the NCP (40 C.F.R. Part 300.505) may be designated CERCLA Lead Agency.

ARTICLE III
GENERAL PROVISIONS

3.01. Restrictions to Run with the Land. This Covenant sets forth protective provisions, covenants, restrictions, conditions, and obligations (collectively "Restrictions"), to which the Property and its Owner are made subject. These restrictions apply to each Owner of every portion of the Property no matter how the Property is improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. Each and every Restriction: (a) runs with the land pursuant to California Civil Code Section 1471; (b) inures to the benefit of and passes with each and

every portion of the Property, (c) is for the benefit of, and is enforceable by the Department and U.S EPA as a third party beneficiary, and (d) is imposed upon the entire Property unless expressly stated as applicable only to a specific portion thereof.

3.02. Binding upon Owners/Occupants. The Restrictions herein shall be binding upon each Owner and Occupant, and shall continue as a covenant running with the Property in perpetuity, except as otherwise provided in this instrument. Pursuant to Civil Code Section 1471 subd. (b), all successive Owners and Occupants of the Property are expressly bound hereby for the benefit of the Department and U.S. EPA.

3.03. Written Notice of the Presence of Hazardous Substances. Prior to the sale, lease, assignment, or other transfer of the Property, or any portion thereof, the owner, lessor, assignor, or other transferor shall give the buyer, lessee, assignee, or other transferee notice that hazardous substances are located on or beneath the Property.

3.04. Incorporation into Deeds and Leases. The Restrictions set forth herein shall be incorporated by reference in each and all deeds and leases for any portion of the Property. Further, each Owner or Occupant agrees to include in any instrument conveying any interest in all or any portion of the Property, including but not limited to deeds, leases, and mortgages, a notice which is in substantially the following form: NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL RESTRICTION AND COVENANT TO RESTRICT USE OF THE PROPERTY, DATED ____, RECORDED IN THE PUBLIC LAND RECORDS ON ___[DATE]___, IN THE BOOK ___, PAGE ___, IN FAVOR OF AND ENFORCEABLE BY THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

3.05. Conveyance of Property. Covenantor agrees that the Owner shall provide notice to the Department not later than thirty (30) days after any conveyance of any

ownership interest in the Property (excluding mortgages, liens, and other non-possessory encumbrances). The Department and U.S. EPA shall not, by reason of this Covenant, have authority to approve, disapprove, or otherwise affect proposed conveyance, except as otherwise provided by law, by administrative order, or by a specific provision of this Covenant.

3.06. Costs of Administering the Restrictions to be paid by Owner. Without in any way limiting the provisions of section 3.01 of this Agreement, the provisions of this section (3.06) run with the land and will continue in perpetuity unless a variance is granted pursuant to section 6.01, or unless terminated pursuant to section 6.02. The Department has already incurred and will in the future incur costs associated with the administration of this Covenant. Therefore, the Covenantor hereby covenants for himself and for all subsequent owners that pursuant to Title 22, California Code of Regulations, section 67391.1(h), the Owner shall pay the Department's cost in administering the Restrictions. Notwithstanding Civil Code section 1466, in the event the Property ownership changes between the time that the Department's administrative costs were incurred and the invoice for such costs is received, each Owner of the Property for the period covered by the invoice, as well as the current Owner is responsible for such costs. Failure of the Owner to pay such costs when billed is a breach of the Covenant and enforceable pursuant to section 5.01 of the Covenant.

ARTICLE IV
RESTRICTIONS

4.01. Prohibited Uses. The Property shall not be used for any of the following purposes:

(a) A residence, including but not limited to any mobile home or factory built housing, constructed or installed for use as residential human habitation.

(b) A hospital for humans.

(c) A public or private school for persons under 21 years of age.

(d) A day care center for children.

(e) A long-term care facility for the elderly, handicapped, or infirm.

(f) Any other purpose involving residential occupancy on a 24-hour basis.

4.02. Soil Management. Any contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of state and federal law and will not be removed from the Property without a Soil Management Plan approved by the CERCLA lead agency.

4.03. Prohibited Activities.

(a) Extraction of groundwater for purposes or uses other than site remediation shall not be permitted on the Property, without prior written approval from the CERCLA lead agency.

(b) The implemented remedy requires effective drainage be maintained property wide. Existing drainage patterns shall not be disturbed at the property, without prior written approval from the CERCLA lead agency.

(c) Creation of topographic low areas where water may pond is prohibited.

(d) Irrigation and any other activity that introduces water to surface or subsurface soils at the Property is prohibited.

(e) Activity (other than required maintenance and monitoring activities) shall not be permitted within the fenced area which encloses the Soil Impoundment Cell and the Groundwater Pump and Treatment System.

(f) Activities that may disturb Asphalt Caps installed at the Property (e.g. excavation, grading, removal, trenching, filling, earth movement, or mining) shall not be permitted without prior written approval from the CERCLA lead agency.

(g) The use of, or construction of, septic tanks, leach fields or other sanitary systems with the exception of a sanitary sewer connection that conveys all waste waters away from the property for disposal and treatment at a publicly owned treatment works.

(h) Construction of any building, appurtenance, fence, shelter, or structure on the Soil Impoundment Cell.

4.04. Non-Interference with Remedial Systems. The Covenantor agrees to refrain from and prevent any activity that could interfere with the operation of the Remedial Systems present at the site. Remedial systems include, but are not limited to, the Soil Impoundment Cell, the RCRA Asphalt Cap, and the Groundwater Pump and Treatment System. The Covenantor specifically agrees that:

(a) Activities that may disturb the Remedial Systems shall not be permitted on the Property without prior written approval by the CERCLA lead agency.

(b) All uses and development of the Property shall preserve the integrity of the Remedial Systems.

(c) The Ground Water Pump and Treat System shall not be altered without written approval by the CERCLA lead agency.

(d) The vegetation covering the Soil Impoundment Cell shall not be altered without written approval by the CERCLA lead agency.

(e) The RCRA Asphalt Cap shall not be altered without written approval by the CERCLA lead agency.

(f) Monitoring wells, on-site impoundments, extraction wells, pumps,

treatment equipment, monitoring systems, plumbing, and utilities shall not be altered without written approval by the CERCLA lead agency.

(g) The recharge (percolation) ponds installed on the Property shall not be altered without written approval by the CERCLA lead agency.

(h) To abandon the high pressure gas line entering the Site on the southeastern corner of the property shall be abandoned in place.

(i) To prevent the use of well 1735 for any purpose other than those required by the Remedial Systems.

(j) To provide all easement holders for all or any portion of the Site with a copy of this Covenant, and to the extent possible prevent such holders from engaging in activities prohibited by this Covenant.

4.05. Access for U.S. EPA and Department. U.S. EPA and the Department shall have reasonable right of entry and access to the Property for inspection, monitoring, and other activities consistent with the purposes of this Covenant as deemed necessary by U.S. EPA or the Department in order to protect the public health or safety or the environment. Nothing in this instrument shall limit or otherwise effect U.S. EPA's right of entry and access, or EPA's authority to take response actions, under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; or federal law. Nothing in this instrument shall limit or otherwise effect the Department's right of entry and access, or authority to take response actions, under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; Chapter 6.8, Division 20 of the California Health and Safety Code (H&SC); California Civil Code, or other applicable State Law.

4.06. Access for Implementing Operation and Maintenance. The entity or person(s) responsible for implementing the operation and maintenance activities relating to the Groundwater Pump and Treat System, Monitoring System, On-Site

Impoundment, and Asphalt Caps shall have reasonable right of entry and access to the Property for the purpose of implementing these operation and maintenance activities. Such right of entry and access shall continue until such time as the CERCLA lead agency determines that such activities are no longer required.

ARTICLE V
ENFORCEMENT

5.01. Enforcement. Failure of the Covenantor, Owner or Occupants to comply with any of the requirements or Restrictions of this Covenant shall be grounds for the Department or U.S. EPA to require that the Covenantor, Owner or Occupant modify or remove, as the Department or U.S. EPA determines appropriate, any non-conforming improvements ("Non-conforming improvements" shall include but not be limited to all buildings, roads, driveways, ponds, drainages, and paved parking areas constructed or placed upon any portion of the Property in violation of the aforesaid restrictions). Violation of this Covenant shall be grounds for the Department or U.S. EPA to file civil or criminal actions, as provided by law.

5.02. Owner's obligation to repair the cap. The Covnenantor hereby covenants for himself and for all subsequent owners, that when the Owner discovers or is advised of damage to the cap or other violations of, the conditions and restrictions herein, the Owner will remedy any such condition that is in violation of any of the restrictions of Article 4, and will do so within a reasonable time. This provision in no way limits the rights of the Owner making such repairs, or remedying violations from seeking compensatory recovery or restitution. This section in no way limits the Department's rights or remedies under law. Nor does it limit the Department's ability to repair and remedy and protect the public health and environment. Nor does it limit the Department's ability or obligation to seek cost recovery against any entity.

ARTICLE VI
VARIANCE, TERMINATION, AND TERM

6.01. Variance. Covenantor, or any other aggrieved person, may apply to the Department for a written variance from the provisions of this Covenant. Such application shall be made in accordance with H&SC Section 25233 (1997) or any successor provisions. Unless and until the State of California assumes CERCLA lead agency responsibility for Site operation and maintenance, no variance may be granted under this paragraph without prior review and prior concurrence of the variance by U.S. EPA. Any approved variance shall be recorded in the land records by the person or entity granted the variance.

6.02. Termination. Covenantor, or any other aggrieved person, may apply to the Department for a termination of the Restrictions or other terms of this Covenant as they apply to all or any portion of the Property. Such application shall be made in accordance with H&SC Section 25234 (1997) or any successor provision. Unless and until the State of California assumes CERCLA lead agency responsibility for Site operation and maintenance, no termination may be granted under this Paragraph 6.02 without prior review and prior written concurrence of the termination by U.S. EPA.

6.03. Term. Unless ended in accordance with the Termination paragraph above, by law, or by the Department in the exercise of its discretion, this Covenant shall continue in effect in perpetuity.

ARTICLE VII
MISCELLANEOUS

7.01. No Dedication Intended. The Covenantor entered into this Agreement as part of a resolution with the Department and U.S. EPA of its alleged liabilities for the Property. Nothing set forth in this Covenant shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Property, or any portion thereof to the general

public or anyone else for any purpose whatsoever. Further, nothing in this Covenant shall be construed to effect a taking under state or federal law.

7.02. Recordation. The Covenantor shall record this Covenant, with all referenced Exhibits, in the County of Fresno within ten (10) days of the Covenantor's receipt of a fully executed original.

7.03. Notices. Whenever any person gives or serves any Notice ("Notice" as used herein includes any demand or other communication with respect to this Covenant), each such Notice shall be in writing and shall be deemed effective: (1) when delivered, if personally delivered to the person being served or to an officer of a corporate party being served, or (2) three (3) business days after deposit in the mail, if mailed by United States mail, postage paid, certified, return receipt requested:

To Owner: Selma Leasing Company
1450 East Front Street
Selma, California 93662-9782

To Department: Mr. James L. Tjosvold, P.E., Chief
Northern California-Central Cleanup Operations Branch
Attn: Mr. Sam Martinez
Department of Toxic Substances Control
8800 Cal Center Drive, 3rd Floor
Sacramento, California 95826-3200

To U.S. EPA: U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105-3901
Attn: Mr. Charnjit Bhullar

Any party may change its address or the individual to whose attention a Notice is to be sent by giving written Notice in compliance with this paragraph.

7.04. Partial Invalidity. If any portion of the Restrictions or other term set forth herein is determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant shall remain in full force and effect as if such portion found invalid had not been included herein.

7.05. Liberal Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed to effect the purpose of this instrument and the policy and purpose of CERCLA. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

7.06. Annual Reporting Requirements. An annual inspection of the property and an annual report are required. After the recording of the deed restriction, the annual report shall be provided to the Department and U.S. EPA by January 15 of each calendar year by the then current owner(s) of the Property. The annual report shall describe how all the requirements outlined in the Deed Restriction have been met. The annual report, filed under penalty of perjury, shall certify that the property is being used in a manner consistent with the terms of the deed restriction and that all steps have been taken to ensure compliance with the deed restriction's terms. If the property owner identifies any violations of the deed restriction during the annual inspections, the property owner must within 90 days of identifying the violation; determine the identity of the party in violation, send a letter advising the party of the violation of the deed restriction and demand that the violation cease immediately. Such letter shall be sent by certified mail with return receipt and signature required.

The annual report must include the dates, times, and names of those who conducted and reviewed the annual inspection. It also shall describe how the observations were

performed that were the basis for the statements and conclusions in the annual report (e.g., drive by, fly over, walk in, etc.). The annual report shall contain a discussion of the integrity of all of the remediation system components at the Site and provide recommendation for repairs, if necessary. If violations are noted by the observer, the annual report must detail the steps taken to return to compliance. Additionally, copies of any correspondence related to the enforcement of the deed restriction shall be sent to the Department and the US EPA within ten days of its original transmission.

IN WITNESS WHEREOF, the Parties execute this Covenant.

"Covenantor"

By: Gerald Petery Date: Feb. 23, 2006
Mr. Gerald Petery
Selma Leasing Company, Inc.

"Department"

By: James L. Tjosvold Date: 4/25/06
James L. Tjosvold, P.E., Chief
Northern California-Central Cleanup Operations Branch
Department of Toxic Substances Control

"U.S. Environmental Protection Agency" as a Third Party Beneficiary

By: Elizabeth Adams for KAT Date: March 15, 2006
Keith Takata, Director
Superfund Division, Region 9
United States Environmental Protection Agency

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California
County of Sacramento } ss.

On 4-25-2006, before me, Kathleen C. Duncan, Notary Public
Date — Name and Title of Officer (e.g., "Jane Doe, Notary Public")

personally appeared James Tyssvold,
Name(s) of Signer(s)

☒ personally known to me

☐ proved to me on the basis of satisfactory evidence to be the person(~~s~~) whose name(~~s~~) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity upon behalf of which the person(~~s~~) acted, executed the instrument.

KATHLEEN C. DUNCAN
Commission # 1628225
Notary Public - California
Sacramento County
My Comm. Expires Dec 9, 2006

Place Notary Seal Above

WITNESS my hand and official seal.

Kathleen Duncan
Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: Covenant to restrict use of property

Document Date: 4-25-2006 Number of Pages: 20

Signer(s) Other Than Named Above: Elizabeth J. Adams for Kitty Sakata

Capacity(ies) Claimed by Signer(s)

Signer's Name:
☐ Individual
☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other:
Signer Is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer's Name:
☐ Individual
☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other:
Signer Is Representing:

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

© 2004 National Notary Association • 9350 De Soto Ave., P.O. Box 2402 • Chatsworth, CA 91313-2402 Item No. 5907 Reorder: Call Toll-Free 1-800-876-6827

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California
County of FRESNO } ss.

On APRIL 11, 2006 (Date), before me, DONNA MURRY - NOTARY PUBLIC (Name and Title of Officer (e.g., "Jane Doe, Notary Public")),

personally appeared GERALD PETERY (Name(s) of Signer(s)),

☒ personally known to me
☐ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Donna Murry
Signature of Notary Public

DONNA MURRY
Commission # 1569115
Notary Public — California
Fresno County
My Comm. Expires May 12, 2009

Place Notary Seal Above

OPTIONAL

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Description of Attached Document

Title or Type of Document: COVENANT TO RESTRICT USE OF PROPERTY, ENVIRONMENTAL RESTRICTION

Document Date: — Number of Pages: 20 PGS INCL ALREADY COMPLETED NOTARIAL CERT.

Signer(s) Other Than Named Above: ELIZABETH J. ADAMS FOR KEITH TAKATA -AND- JAMES L. TJOSVOLD

Capacity(ies) Claimed by Signer

Signer's Name: _____

☐ Individual
☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing: _____

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STATE OF CALIFORNIA)
)
COUNTY OF SAN FRANCISCO)

On this __15th_____day of ____March_____in the year ____2006_____,

before me **Kathleen L. Kawakami**, NOTARY PUBLIC personally appeared Elizabeth J. Adams personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Notary Signature Kathleen L. Kawakami

KATHLEEN L. KAWAKAMI
Commission # 1600443
Notary Public - California
San Francisco County
My Comm. Expires Sep 9, 2009

Optional

Description of Attached Document: _____Covenant to Restrict Use of Property - Fresno County Assessors Parcel Number 39-011-057 and Assessors Parcel Number 39-011-059 _____

Document Date: _____Undated_____ Number of Pages: _____19 pages_____

Signer(s) other than named above: _____None_____

EXHIBIT A

LEGAL DESCRIPTION

COVENANT TO RESTRICT USE OF PROPERTY

ENVIRONMENTAL RESTRICTION

(California Civil Code section 1471 (c))

(Re: Fresno County APN # 39-011-057 and APN # 39-011-059)

EXHIBIT A

LEGAL DESCRIPTION

That real property composed of two parcels, situated in the county of Fresno, state of California and described as follows:

PARCEL 1:

{As written in document number 53015, Book 5911, page 466 of the Official Records of Fresno County, recorded July 6, 1971}
Being a portion of the Northwest quarter of Section 8, Township 16 South, Range 22 East, Mount Diablo Base and Meridian per U.S. Government surveys, and more particularly described as follows:

COMMENCING at the center of said Section 8; thence N 0° 39' E, along the north-south centerline of said Section 8; a distance of 667.00 ft; thence N 89° 21' W, a distance of 433.00 ft to the Southwest corner of that certain parcel of land deed to Selma Pressure Treating Co. and recorded October 21, 1970, in book 5829, page 976, said Southwest corner being the point of beginning of this description; thence continuing N 89° 21' W, a distance of 891.32 ft.; thence N 0° 43' 38" E a distance of 656.28 ft; thence S 89° 36' 45" E, a distance of 880.04 ft.; thence N 42° 26' 49" E, a distance of 15.62 ft., to the Northwesterly corner of said Selma Pressure Treating Company property; thence S 8° 39' W, along the West property line of said Selma Pressure Treating Company property, a distance of 671.95 ft., to the point of beginning of this description.

PARCEL 2:

{As written in document number 48222, Book 6168, page 210 of the Official Records of Fresno County, recorded May 23, 1973} Being a portion of the Southeast Quarter of the

Northwest Quarter of Section 8, Township 16 South, Range 22 East, Mount Diablo Base and Meridian, per U. S. Government surveys, and more particularly described as follows:

Beginning at a point on the West right-of-way line of Dockery Avenue said point bears 0° 39' 00" East 667.00 feet and N 89° 21' West, 20.00 feet from the center of said Section 8; thence N 89° 21' 00" West, a distance of 413.00 feet; thence N 0° 39' 00" East, a distance of 671.95 feet to a point on the Northwest line of that certain parcel of land deeded By the State of California to R. J. Petery, et ux, as shown in Book 3676, Page 180, dated October 31, 1955, Official Fresno County Records; thence N 42° 26' 49" East along said Northwest line, a distance of 36.88 feet to a point on the Southwesterly right-of-way line of Golden State Boulevard; thence South 41° 03' 45" East, along said Southwesterly right-of-way line of Golden State Boulevard, a distance of 583.74 feet to a point on the intersection of the West right-of-way line of Dockery Avenue; thence S 0° 39' 00" West, along said West right-of-way-line of Dockery Avenue, a distance of 263.69 feet to the point of the beginning.

EXHIBIT B

SITE DIAGRAM

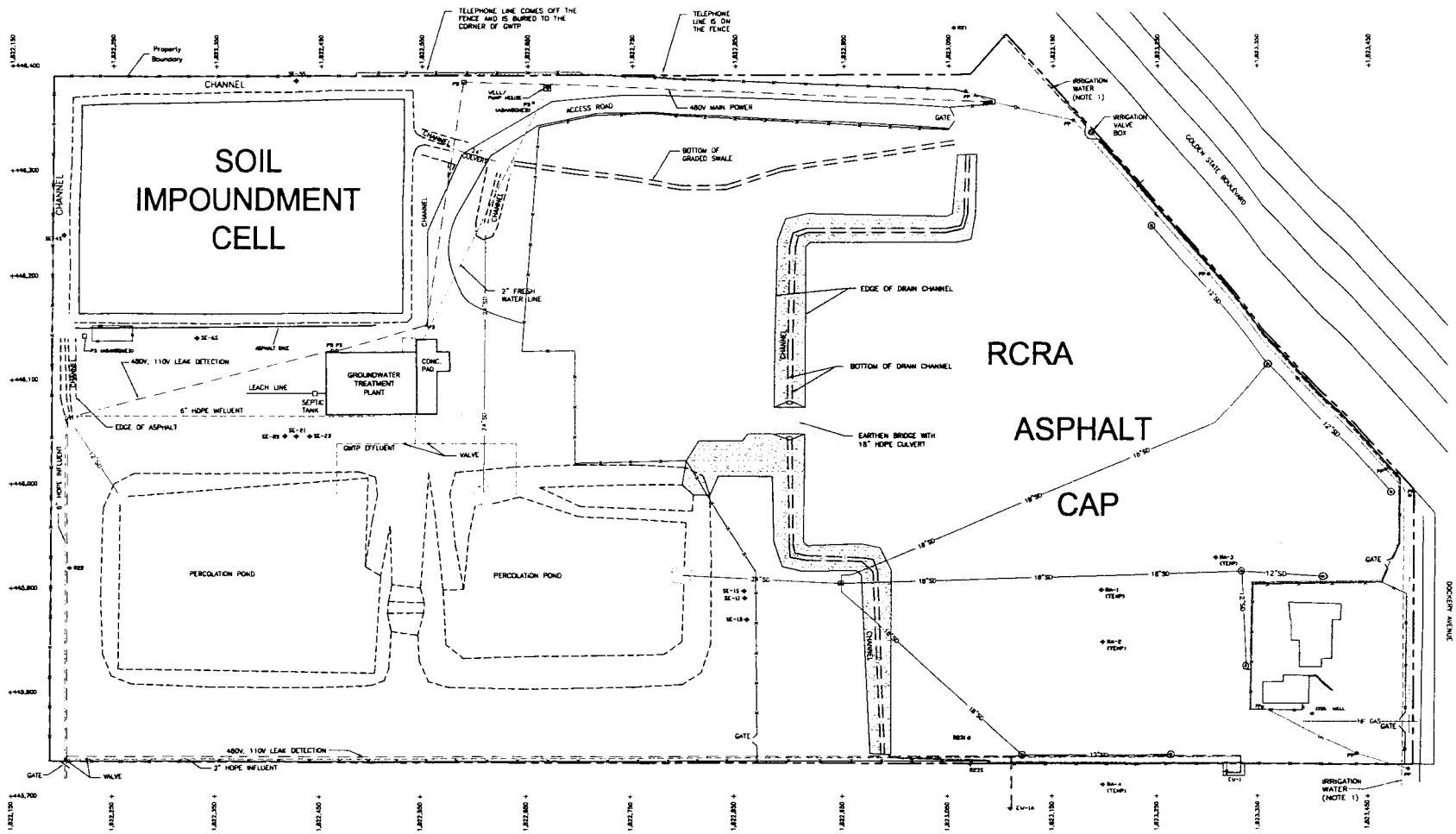
COVENANT TO RESTRICT USE OF PROPERTY

ENVIRONMENTAL RESTRICTION

(California Civil Code section 1471 (c))

(Re: Fresno County APN # 39-011-057 and APN # 39-011-059)

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	SJZ 9/15/05	CC 9/15/05	LH 9/15/05	845729-D1



LEGEND

- PROPERTY BOUNDARY
- FENCE
- PULL BOX
- MONITORING WELL
- STORM WATER CATCH BASIN (PVC)
- STORM WATER CATCH BASIN (PCC)
- STORM DRAIN
- ELECTRICAL LINE (BURIED)
- TELEPHONE LINE (OH: OVERHEAD, PP: POWER POLE)
- WATER LINE (BURIED)
- DOMESTIC HIGH PRESSURE GAS LINE (BURIED)
- RCRA ASPHALT CAP BOUNDARY (DARKER SHADE DENOTES CURBED EDGE)
- TYPE A ROCK RIPRAP
- TYPE B ROCK RIPRAP
- GRAVEL

SURVEY COORDINATES FOR ONSITE MONITORING WELLS

WELL	NORTH	EAST
1735	445787.54	1823398.93
EW-1	445723.29	1823317.07
SE-1S	445897.57	1822859.44
SE-11	445890.61	1822859.95
SE-10	445870.20	1822869.38
SE-2S	446046.92	1822416.82
SE-21	445046.64	1822427.34
SE-2D	446046.66	1822439.89
SE-4S	446238.87	1822201.04
SE-3S	[illegible]	[illegible]
SE-6S	446140.77	1822331.19
R22	445919.57	1822207.37
R23	445756.11	1823071.12

NOTES:

1. LOCATIONS OF SITE UTILITIES ARE APPROXIMATE. USER SHOULD PERFORM UNDERGROUND UTILITY LOCATION BEFORE ANY EXCAVATION OR EARTH WORK ACTIVITIES.
2. ANY EXCAVATION, EARTH WORK ACTIVITY, OR MODIFICATION TO THE CAPS OR SITE FEATURES MUST BE COORDINATED THROUGH THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCE CONTROL.

SCALE: 0 50 100 150 FEET

Shaw Environmental, Inc.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

SELMA PRESSURE TREATING SUPERFUND SITE
SITE COMPOSITE PLAN

SELMA CALIFORNIA

Appendix E. Human Health and the Environment Risk Assessment

Human Health and Environment Risk Assessment Review

Human Health Risk Assessment Review

A human health risk assessment was completed for the site as part of the 1988 ROD. The risk assessment was reviewed to identify any changes in exposure or toxicity that would impact protectiveness.

Human exposure pathways for the Site include exposure to contaminated groundwater, exposure via direct contact with contaminated soil (including incidental ingestion), and inhalation of contaminated dust. Receptors included both nearby residents and on-site workers. In summary, under the evaluated current-use scenarios exposure to contaminated soils posed a carcinogenic risk, and under the evaluated future-use scenarios exposure to contaminated groundwater posed both a carcinogenic and non-carcinogenic risk.

Residential groundwater wells currently exist downgradient of the Site and within the current groundwater hexavalent chromium extent, but these wells are reportedly used primarily for irrigation and residential landscaping purposes. However, potential exposure pathways do exist for incidental ingestion and dermal contact with groundwater from these wells. An investigation into the use and application of residential/irrigation groundwater, and additional human receptors (in particular farm workers) is required to fully understand these new exposure pathways.

In addition, since the extent of the hexavalent chromium plume is not well defined southwest of the Site, it is unknown if additional residential/irrigation wells could be impacted. An investigation to further define the hexavalent chromium plume is required to fully understand the extent of possible exposure pathways.

Vapor Intrusion: EPA's understanding of contaminant migration from soil gas and/or groundwater into buildings has evolved over the past few years, leading to the conclusion that vapor intrusion may have a greater potential for posing risk to human health than assumed when the ROD was prepared. EPA evaluates the potential for vapor intrusion using a "multiple lines of evidence" approach consistent with its 2015 vapor intrusion guide, "OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air," OSWER Publication 9200.2-154. Numerical screening levels are derived in the Vapor Intrusion Screening Level calculator, http://www2.epa.gov/vaporintrusion

There is no potential for vapor intrusion at this Site because no COCs have sufficient volatility to form vapors.

Toxicity values: EPA's Integrated Risk Information System (IRIS) has a program to update toxicity values used by the Agency in risk assessment when newer scientific information becomes available. In the past five years, there have been a number of changes to the toxicity values for COCs at the Site.

To evaluate the protectiveness of the cleanup standards for this FYR, those standards were compared to EPA's current Regional Screening Levels (RSLs). The RSLs for cancer are chemical-specific

concentrations for individual contaminants that correspond to an excess cancer risk level of $1x10^{-6}$ (or a Hazard Quotient (HQ) of 1 for non-carcinogens), and they have been developed for a variety of exposures scenarios (e.g., residential, commercial/industrial). RSLs are not de facto cleanup standards for a Superfund site, but they do provide a good indication of whether actions may be needed to address potential human health exposures. The EPA risk range is between $1x10^{-6}$ and $1x10^{-4}$. RSL values that fall within this range were determined to be acceptable from a risk stand point. The non-cancer RSLs correspond to a hazard index of 1. Table 1 presents a comparison for groundwater COCs, and Table 2 presents a comparison for soil COCs.

Table 1. Comparison of Tap Water RSL to ROD Cleanup Standards

Contaminant of Concern	2015 Tap Water RSL for Cancer Risk (µg/L)	Protective Cancer Risk Range (µg/L)	2015 Tap Water RSL for Non-cancer Hazard (µg/L)	Groundwater Cleanup Standard (µg/L)	Is the Cleanup Standard still protective?
Arsenic	0.052	0.052 – 5.2	6	50	No
Chromium, total	--	--	--	50	N/A
Pentachlorophenol	0.041	0.041-4.1	44	1	Yes

Any concentration below the cancer RSL indicates that cancer risk is low, while concentrations significantly above the cancer RSL may indicate an increase in cancer risk. For pentachlorophenol, the groundwater cleanup standard is within the protective cancer risk range and is therefore considered protective with respect to cancer risks. The groundwater cleanup standard for arsenic is above the protective cancer risk range, and groundwater monitoring since the last Five Year Review showed concentrations of arsenic between non-detect and 31 µg/L, with 41% of samples above 5.2 µg/L (the upper cancer risk range limit). Therefore, the cleanup standard for arsenic may not be protective with respect to cancer risk. However, the elevated arsenic concentrations are located at monitoring wells on Site where there is no exposure to groundwater, so the overall remedy is still protective for arsenic cancer risk.

Any concentration below the non-cancer RSL indicates that no adverse health effect from exposure is expected, while concentrations significantly above the non-cancer RSL may indicate an increased potential for non-cancer effects. For pentachlorophenol, the groundwater cleanup standard is below the tap water RSL for non-cancer risk, and therefore no adverse health effects are expected. Arsenic, however, has a groundwater cleanup standard greater than the non-cancer RSL. As described above, recent groundwater sampling showed arsenic concentrations between non-detect and 31 µg/L, with 34% of samples above 6 µg/L (the non-cancer RSL). Therefore, the cleanup standard for arsenic may not be protective with respect to non-cancer risk, but since there is no exposure the remedy is still protective for arsenic non-cancer risk.

Currently EPA does not have tap water RSLs for total chromium, so an evaluation of the groundwater cleanup standard versus the RSLs could not be completed. In recent years, however, there has been

increased interest in evaluating chromium instead based upon one of its species, hexavalent chromium, primarily because of hexavalent chromium's increased toxicity and mobility in groundwater. In 2015, EPA updated its RSLs for hexavalent chromium. The RSL update was based on a revised toxicity assessment by the New Jersey Department of Environmental Protection (2009) following new toxicity information from the National Toxicology Program (2008). The current (2016) hexavalent chromium RSL for tap water ingestion is 0.052 µg/L. There is significant scientific discussion on the basis of the health protective assumptions used to derive this value and the extrapolations from higher doses in the animal studies and the relevance for humans at much lower levels. In 2011 the California Office of Environmental Health Hazard Assessment (OEHHA) finalized a new Public Health Goal (PHG) for hexavalent chromium at 0.02 µg/L based on the same studies and similar assumptions as to the biological effects at low doses as in the New Jersey derivation. A PHG is a level of contaminant in drinking water that does not pose a significant health risk over a lifetime of exposure. The federal MCL for total chromium is set at 100 µg/L and a California MCL for total chromium is set at 50 µg/L. These total chromium MCLs assume that the majority of chromium in drinking water is in the hexavalent state. The current cleanup level for total chromium is 50 µg/L, which if it is comprised of 100% hexavalent chromium, may not be considered protective. Groundwater sampling since the last Five Year Review included only seven samples for total chromium, with the results ranging from 5.35 to 103 µg/L. Three of the samples were above the 50 µg/L cleanup level, with two more very near (within 10%) of the cleanup level.

California recently (2014) released an MCL specific to hexavalent chromium of 10 µg/L. The U.S. EPA IRIS (Integrated Risk Information System) program is conducting its own re-assessment of the toxicity of hexavalent chromium and EPA has committed to revising the chromium MCL upon completion of the IRIS re-assessment. Groundwater sampling since the last FYR has shown hexavalent chromium concentrations between non-detect and 482 µg/L, with 59% of the data above California's new 10 µg/L MCL. It should be noted that the detection limit typical to these analyses was 10 µg/L. In the future, to gain higher quality data near the new state MCL value, a method should be used with a detection limit lower than 10 µg/L.

Table 2. Comparison of Resident Soil RSL to ROD Cleanup Standards

Contaminant of Concern	2015 Resident Soil RSL for cancer risk (mg/kg)	Protective Cancer Risk Range (mg/kg)	2015 Resident Soil RSL for non-cancer hazard (mg/kg)	Soil Cleanup Standard (mg/kg)	Is the Cleanup Standard still protective?
Arsenic	0.68	0.68 - 68	35	25	Yes
Pentachlorophenol	1.0	1.0 - 100	250	17	Yes

Any concentration below the cancer RSL indicates that cancer risk is low, while concentrations significantly above the cancer RSL may indicate an increase in cancer risk. For arsenic and pentachlorophenol, the soil cleanup standard is within the protective cancer risk range and are therefore

considered protective with respect to cancer risks. The vegetative and asphalt caps are in good condition preventing exposure to contaminated soil. Therefore, the remedy is still protective with respect to cancer risk.

Any concentration below the non-cancer RSL indicates that no adverse health effect from exposure is expected, while concentrations significantly above the non-cancer RSL may indicate an increased potential for non-cancer effects. For arsenic and pentachlorophenol, the soil cleanup standards are below their respective resident soil RSLs for non-cancer risk, and therefore no adverse health effects are expected. The vegetative and asphalt caps are in good condition preventing exposure to contaminated soil. Therefore, the remedy is still protective with respect to non-cancer risk.

Ecological Review

An ecological risk assessment has not been completed for the Site. There is no ecological exposure pathway for onsite soils and groundwater. However, groundwater used for irrigation does create a potential exposure pathway for groundwater ingestion and/or dermal exposure to ecological receptors. There are no sensitive habitats or listed species in the plume or Site areas, therefore, the remedy is protective to ecological receptors.

Appendix F: Public Notice

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Publication- The Selma Enterprise Kingsburg Recorder

State of California

County of Fresno

I am a citizen of the United States and a resident of the county forsaid; I am over the age of eighteen years, and not a part to or interested in the above-entitled matter. I am the principal clerk of The Selma Enterprise Kingsburg Recorder, a newspaper of general circulation, printed and published daily in the city of Selma and Kingsburg, County of Fresno, and which newspaper has been adjudged a newspaper of general circulation by the superior court of the County of Fresno, State of California, under the date of July 8, 1952, case number 86769(Selma), and September 20, 1953, case number 84716 (Kingsburg).

That I know from my own personal knowledge the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said nespaper and not in any supplement thereof on the following dates, to wit:

PUBLISHED ON: 06/08/2016

PUBLIC NOTICE

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY BEGINS FOURTH Five-Year Review OF CLEANUP AT THE SELMA PRESSURE TREATING SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) has begun its fourth Five-Year Review (FYR) of the Selma Pressure Treating Superfund Site located in Selma, California. The Five-Year Review determines if the cleanup remedy is meeting the EPA's goal of protecting human health and the environment. The last Five-Year Review was completed in 2011.

THE REVIEW PROCESS

The primary purpose of a Five-Year Review is to determine whether a site remedy remains protective of human health and the environment. EPA generally conducts Five-Year Reviews when hazardous substances remain in the groundwater above risk-based levels that prevent unrestricted use and exposure. As part of the review, EPA will be looking at how well the remedy is achieving EPA's cleanup goals, changes in scientific knowledge about site contaminants, changes in exposure pathways, and changes in regulations.

SITE HISTORY

The Site was placed on the National Priorities List (NPL) in September 1983 for soil and groundwater contamination. The primary contaminants of concern affecting the soil and groundwater is hexavalent chromium or chromium (VI). This Five-Year Review is scheduled to be completed by September 2016.

COMMUNITY INVOLVEMENT

If you have any concerns about the Selma Pressure Treating Site, and particularly if you have direct knowledge regarding the operation and maintenance of the remedy, then EPA would like to talk with you. When completed, a copy of the final report will be placed in the local information repository listed below and a notice will appear in the local paper announcing the results of the Five-Year Review Report.

If you have any questions regarding the Selma Pressure Treatment Superfund Site Five-Year Review, please contact either of the EPA staff below:

Grace Ma
EPA Remedial Program Manager
US Environmental Protection Agency
Ma.grace@epa.gov
415-947-4212

Viola Cooper
EPA Community Involvement Coordinator
US Environmental Protection Agency
cooper.viola@epa.gov
415-972-3243
Toll-free message line 800-231-3075

EPA's website: https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/Selma+Treating+Co.?OpenDocument

The Administrative Record for the site, including all documents related to the Five-Year Review, is located at:

Fresno County Library
Selma Branch
2200 Selma Street
Selma CA 93662
(559) 896-3393

CNS-2883659#

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Fresno County, California

This Day 08 of June, 2016

Signature

A000004129010

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Appendix G: Interview Forms

Notes on Interviews:

Geosyntec Consultants, Inc. is the current O&M contractor for the Site in charge of operating the ISB treatment system.

CB&I is the previous O&M contractor (contract ended in 2015); CB&I is the contractor for the hexavalent chromium groundwater plume investigation currently underway. The purpose of this investigation is to define the boundaries of the plume at the 10 µg/L (the new California MCL for hexavalent chromium).

Five-Year Review Interview Record			
Site: Selma Treating Company Superfund Site		**EPA ID No:**	CAD029452141

Interview Type: *Visit*
Location of Visit: Selma, California
Date: 1/26/16
Time: 12:15

Interviewers

Name	Title	Organization
Blair C Kinser	Environmental Engineer	USACE

Interviewees

Name	Organization	Title	Telephone	Email
Scott Forbess	Geosyntec	Site Manager	5304003415	
Nick White	Geosyntec	Operator	6199203415	
Tim Patenaude	DTSC	Project Manager	9162553580	

Summary of Conversation

1) What is your overall impression of the project?

The in situ bioremediation system has been operating and functioning. Now that Geosyntec has taken over the contract, we will be looking into optimizing the way the remedy operates.

2) Is the remedy functioning as expected? How well is the remedy performing?

Yes, in the past the remedy was operating 50% of the time due to electrical problems and power outages. Currently we are operating near 100% of the time.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Yes declines in contaminant levels have occurred around the extraction and injection wells. However, downgradient wells south of the remedy treatment area may not be showing declining trends.

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

We do not have a constant presence. Nick White is here once a week. He inspects vaults, the treatment system, fences, and he records readings from our instruments. He also looks at flow rates, and replaces the molasses and the biocide when it is getting low.

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts.

We are currently only pumping from one well due to the decline in the groundwater levels. This has happened more recently due to the drought so we are not sure of the impacts on the remedy. We may not get full capture of the hexavalent chromium groundwater plume because of this. In addition we are unsure of how vertical migration of the hexavalent chromium groundwater plume could impact the efficiency of the remedy.

6) What are the annual operating costs for your organization's involvement with the site?

Tim Patenaude can provide this information later.

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

There have been difficulties due to groundwater level declines and electrical issues as we stated in the site checklist. There is biocide fouling which is inherent with the system. As noted in the checklist, DTSC has always stayed within our budget.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

As we previously mentioned, we plan to automate the system and upgrade the communication. We are also planning to lower the extraction wells and pumps due to the declining water levels. 9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy? We are aware of the State of California MCL that lowers hexavalent chromium to 10 parts per billion in public drinking water systems. EPA is taking the MCL into consideration. 10) Do you have any comments, suggestions, or recommendations regarding the project? EPA is currently conducting a groundwater characterization of the site. Geosyntec has completed upgrades to the health and safety plans. They are planning additional upgrades. The old groundwater treatment system equipment and tanks (including sand filters and sludge press) in the warehouse should be salvaged/reused/recycled.
Additional Site-Specific Questions
N/A

Five-Year Review Interview Record			
Site: Selma, CA		**EPA ID No:**	

Interview Type: Teleconference
Location of Visit: n/a
Date: 2/23/2016
Time: 9:00 am Pacific Time

Interviewers

Name	Title	Organization
Jayson Osborne	Biologist	USACE

Interviewees

Name	Organization	Title	Telephone	Email
Grace Ma	EPA	RPM	415-947-4212	ma.grace@epa.gov
Steven Pierce	CB&I	Project Manager for previous DTSC O&M contract/Technical Lead for current EPA plume investigation	(925) 381-9014	Steven.pierce@CBI.com
John McMillan	CB&I	Project Manager for the current EPA plume investigation		John.McMillan@CBIFederalServices.com
Michael Yurovski	CB&I			

Summary of Conversation

Note: primarily Steve Pierce provided answers unless noted otherwise.

1) What is your overall impression of the project?

I think the project has gone very well – there have been significant changes: the lowering of the CA hexavalent Chromium MCL and lowering water levels due to drought and increased water demand due to drought.

2) Is the remedy functioning as expected? How well is the remedy performing?

The remedy is generally functioning as expected. The remedy was performing well until declining water levels impeded the ability of the system to circulate water. Extraction wells had declining production as of mid 2015 that have impeded effectiveness of the system.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

The data clearly shows a dramatic reduction in contaminant levels in the treatment area. Recent increases in some wells is attributed to recent drought and changes in local groundwater usage by farmers in the area. Yes, the graph that was sent yesterday – the graph is updated monthly and shows extraction well contaminant levels. The graph shows a decrease in contaminant levels as well as dates of significant project milestones (e.g. Phase 3 start up)

4) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

There was an O&M presence, but that is no longer in CB&I's contract. CB&I is no longer the O&M contractor for DTSC; they are currently leading an investigation to define the extent of the Chromium plume under contract with EPA. (John McMillan clarified that CB&I had been the O&M contractor for the site under a DTSC contract that recently ended; CB&I is also currently under contract with EPA to

perform the plume delineation study.)

5) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts.

The only substantial change has been due to declining water levels at the site. Several extraction wells could not be operated. Near the end, only one pump could be operated (only manually, to protect the pump from damage). This decrease in water level and subsequent decrease in the amount of water that can be circulated does negatively affects the remedy. Cannot move as much water as before the drought. (Note: Grace Ma followed up with the following questions: Which extraction wells were affected and could not be operated? Which wells stopped working and when? Steve Pierce indicated that he can provide this information.)

6) What are the annual operating costs for your organization's involvement with the site?

O&M costs from Feb 2014 to Feb 2015 were $159,443.00. There is monthly reporting on system operation and things of note which have project management costs. During this period, there was $22,129 in project management and reporting costs. (Note: Grace indicated that it would be good to get costs of the current investigation study as well.)

7) Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

It has to do with the drought over the past few years and the need to operate a well manually. Reliability of electrical power is not good at the site. Ongoing problem with system shut downs/restart due to power outages. System damage during lightning storms. Above ground equipment (well heads, etc.) occasionally damaged by farm equipment operating in the area.

8) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

Regarding O&M, because of daily presence at the site, they could inspect advance piping that was subject to damage in adjacent farmland. We would not have gotten much benefit from installing additional equipment for remote monitoring of the site since someone was on site daily. Upfront cost of installing remote monitoring was high.

9) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy?

Oh yes. The CA MCL for hexavalent chromium has dropped to 10 micrograms per liter. There are no other changes in the regulatory regime that impact remedy protectiveness.

10) Do you have any comments, suggestions, or recommendations regarding the project?

First, with the changes to the (hexavalent chromium) MCL – we need to define the vertical and lateral extent of the chromium plume at the new MCL. Then determine what changes to the treatment system need to be made to effectively treat at this lower level. It would also help to perform bench scale tests of other substrates to determine how to effectively treat hexavalent chromium at these lower levels without mobilizing additional arsenic.

Additional Site-Specific Questions

11) Is the arsenic mobilization that is occurring thought to be temporary?

Should be temporary. Early on with some injections, we saw levels go up, then attenuate. Currently, we don't add too much substrate - we don't need the system to go entirely anaerobic. Just need enough to get Chromium 6 to change to Chromium 3.

Appendix H: Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Selma Treating Company Superfund Site	**Date of inspection:** 1/26/16
Location: 1735 Dockery Avenue Selma, California	**EPA ID:** CAD029452141
Agency, office, or company leading the five-year review: EPA Region 9	**Weather/temperature** Sunny/ 51 F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other:

  In situ bioremediation
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection-team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Scott Forbess (Name) Project Manager (Title) 1/26/16 (Date)
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 9162553580
   Problems, suggestions; ☒ Report attached See Interview Form

2. **O&M staff** Nick White (Name) Site Operator (Title) 1/26/16 (Date)
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 6199203415
   Problems, suggestions; ☐ Report attached See Interview Form

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency DTSC
Contact Tim Patenaude | Project Manager | 1/26/16 | 9162553580
Name | Title | Date | Phone no.
Problems; suggestions; ☒ Report attached See Interview Form

Agency Geosyntec
Contact Nick White | Site Operator | 1/26/16 | 6199203415
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached See Interview Form

Agency
Contact
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name | Title | Date | Phone no.
Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ☐ Report attached.

N/A

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks Currently updating the Piping & Instrumentation documentation (P&ID) plan.

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A
☒ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A
Remarks

3.	**O&M and OSHA Training Records** Remarks	■ Readily available	☐ Up to date	☐ N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☐ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☐ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	■ N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
5.	**Gas Generation Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
6.	**Settlement Monument Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
7.	**Groundwater Monitoring Records** Remarks	■ Readily available	■ Up to date	☐ N/A
8.	**Leachate Extraction Records** Remarks	■ Readily available	■ Up to date	☐ N/A
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	■ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
10.	**Daily Access/Security Logs**	■ Readily available	■ Up to date	☐ N/A
	Remarks Sign up sheet was filled out by site visit personnel from Seattle USACE and EPA region 9.			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ■ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other EPA is conducting a groundwater investigation with support from CB&I. The State of California Department of Toxic Substances Control (DTSC) maintains and operates the remedy with support from Geosyntec.

2. **O&M Cost Records**

☐ Readily available ☐ Up to date ☐ Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons:

O&M budget data to be provided by DTSC site manager.
Electrical upgrades are needed.
All costs have been within budget.

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ■ Gates secured ☐ N/A

Remarks

B. Other Access Restrictions

1. **Signs and other security measures** ■ Location shown on site map ☐ N/A

Remarks Signs were noted on site at three different gates. Fencing was located all around the site and was in good condition.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ■ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ■ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Personnel on site weekly
Frequency Weekly
Responsible party/agency Department of Toxic Substances Control (DTSC) with Geosyntec contractor support
Contact Tim Patenaude (Name) Project Manager (Title) 1/26/16 (Date) 6199203415 (Phone no.)

Reporting is up-to-date ■ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ■ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ■ Yes ☐ No ☐ N/A
Violations have been reported ■ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ■ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ■ No vandalism evident
Remarks

2. **Land use changes on site** ☐ N/A
Remarks None planned

3. **Land use changes off site** ☐ N/A
Remarks None planned

VI. GENERAL SITE CONDITIONS

A. Roads ■ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ■ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks

A 250-500 gallon storage tank was noted on the asphalt cap without secondary containment. The tank holds engine oil and is located less than 50 feet from the drainage ditch.

VII. LANDFILL COVERS ☐ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ■ Settlement not evident
   Areal extent_____ Depth_____
   Remarks

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths 10 feet or less Widths less than 1/4" Depths less than 1/4"
   Remarks Cracks were minimal and no seepage is expected to occur. Preventative maintenance should occur such as filling or repaving the cracks.

3. **Erosion** ☐ Location shown on site map ■ Erosion not evident
   Areal extent_____ Depth_____
   Remarks

4. **Holes** ■ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks Soil impoundment near the old GW treatment plant showed minimal signs of burrowing animals and some settlement. The extent of which does not impact the protectiveness of the remedy.

5. **Vegetative Cover** ■ Grass ☐ Cover properly established
   ■ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks Small mushrooms were noted on the top surface of the vegetative cap.

6. **Alternative Cover (armored rock, concrete, etc.)** ■ N/A
   Remarks

7. **Bulges** ☐ Location shown on site map ■ Bulges not evident
   Areal extent_____ Height_____
   Remarks

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks None noted other than within drainage ditches.

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ■ No evidence of slope instability
Areal extent_____
Remarks

B. Benches ■ N/A ■ Applicable
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ■ N/A or okay
Remarks

2. **Bench Breached** ☐ Location shown on site map ■ N/A or okay
Remarks

3. **Bench Overtopped** ☐ Location shown on site map ■ N/A or okay
Remarks

C. Letdown Channels ■ Applicable ■ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ■ No evidence of settlement
Areal extent_____ Depth_____
Remarks

2. **Material Degradation** ☐ Location shown on site map ■ No evidence of degradation
Material type_____ Areal extent_____
Remarks

3. **Erosion** ☐ Location shown on site map ■ No evidence of erosion
Areal extent_____ Depth_____
Remarks

4. **Undercutting** ☐ Location shown on site map ■ No evidence of undercutting
Areal extent_____ Depth_____
Remarks

5. **Obstructions** Type_____ ■ No obstructions ☐ Location shown on site map
Areal extent_____ Size_____
Remarks

6. **Excessive Vegetative Growth** Type_____
■ No evidence of excessive growth
■ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks

D. Cover Penetrations ■ Applicable ☐ N/A

1. **Gas Vents** ■ N/A ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration
Remarks

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ■ N/A
Remarks

3. **Monitoring Wells** (within surface area of landfill)
■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ■ N/A
Remarks

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ■ N/A
Remarks

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks N/A

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks N/A

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks N/A

F. Cover Drainage Layer ☒ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☒ Functioning ☐ N/A
Remarks

2. **Outlet Rock Inspected** ☒ Functioning ☐ N/A
Remarks

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** ☐ N/A ☒ Siltation not evident
Areal extent_____ Depth_____
Remarks

2. **Erosion** Areal extent_____ Depth_____ ☒ Erosion not evident
Remarks

3. **Outlet Works** ☒ Functioning ☐ N/A
Remarks One culvert was noted as being halfway covered in silt. In the future this may impede flow to the basins on site. See photos.

4. **Dam** ☐ Functioning ☒ N/A
Remarks

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☒ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks N/A

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks N/A

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
Areal extent_____ Depth_____
Remarks

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☒ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks N/A

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored ☐ Evidence of breaching
Frequency_____ Head differential_____
Remarks N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks

3. **Spare Parts and Equipment**
☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks

B. Surface Water Collection Structures, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks N/A

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks N/A

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks N/A

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☒ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☒ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually_____
☐ Quantity of surface water treated annually_____
Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks In good condition and secured.

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ■ Good condition ■ Proper secondary containment ☐ Needs Maintenance
Remarks

4. **Discharge Structure and Appurtenances**
■ N/A ☐ Good condition ☐ Needs Maintenance
Remarks

5. **Treatment Building(s)**
☐ N/A ■ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks

6. **Monitoring Wells** (pump and treatment remedy)
■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
■ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

D. Monitoring Data

1. Monitoring Data
■ Is routinely submitted on time ■ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ■ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ■ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Due to declining groundwater levels, there is only one extraction well operating. Geosyntec is planning to lower injection wells pumps to treat deeper groundwater. The costs of the remedy have decreased due to the reduction in groundwater treated and amount of substrate injected.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

No issues were noted in regards to O&M procedures.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Unexpected changes include the inconsistency with the power supply to the equipment. Upgrades to the electrical system have included installing a uninterrupted power supply (UPS). No significant changes to cost or scope have occurred.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Automation of the remedy will decrease the cost.
Lowering the pumps in the extraction wells will increase the life and effectiveness of the wells.
No other opportunities noted.

Appendix I: Trip Report and Photographs from Site Inspection Visit

Trip Report
Selma Treating Plant, Selma, CA

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1. INTRODUCTION

a. Date of Visit: 1/26/16

b. Location: Selma Treating Plant

c. Purpose: A site visit was conducted to visually inspect and document the conditions of the remedy, the site, and the surrounding area for inclusion into the Five-Year Review Report.

d. Participants: *List all attendees*

Blair Kinser	USACE, Environmental Engineer	2067646875
Grace Ma	EPA, Remedial Project Manager	4159474212
Tim Paternaude	DTSC, Project Manager	5304003415
Scott Forbiss	Geosyntec, Site Manager	9162553580
Nick White	Geosyntec, Operataor	6199203415

2. SUMMARY

Nick White provided a site safety briefing and had all the participants sign in at the site. After the briefing the team headed toward the soil impoundment which was inspected for any significant settlement or damage (Location #1). Only minor burrow holes and settlement were noticed in the southwest portion of the impoundment. The drainage ditch and culvert in this area was also inspected along the edge of the impoundment no issues were noted. The participants than walked through the old groundwater treatment plant. The facility was well kept and no significant damage was noted. At the south end of the treatment plant a cleaning pad had sitting water (Location #2). The Geosyntec members noted the issue and said that the curb towards the south would be broken up and a French drain would be constructed to lead any water to the drainage ponds on site. The participants then walked due south towards the phase 3 injection system (Location #3). The system was noted to be leaking at two gaskets and at a valve. The Geosyntec members said that the leaking would be fixed within a couple of weeks. The area around the system was well kept and orderly. The Geosyntec team described how the system would be automated so that the operator would not be needed on the site on a weekly basis. In addition, the operations of the system was described. The most important aspects was the amount of extraction occurring on site which has declined to 50 gpm due to declining water levels in the area. 3 injection wells are also in operation which inject molasses and biocide. The biocide is utilized to clean up any bio fouling that may occur during the injections. The electrical panel and wells near the system were noted to be secured with a pad lock.

The participants then traveled north and the interview and items in the site inspection checklist were reviewed. The interview consisted of 9 questions and the checklist consisted of 13 pages. These documents can be seen in Appendix G of the FYR.

The team then traveled east to inspect the asphalt cap (Location #4). The area of the cap is currently being used as a recycling facility in which operations cover nearly 30% of the surface.

In places that were not covered by recycling operations the asphalt cap was in good condition. Generally cracks were no longer than 5 feet, with a width or depth greater than a quarter of an inch. The fence surrounding the cap was in good condition with no damage being noted. Recycling debris was noted in the drainage ditch to the east of the cap. Water in the drainage ditch had no visible sheens although an engine oil tank (with no secondary containment) and grease spills were noted within 20 feet of the ditch (Location #5). A couple of stormwater drains did have sediment barriers but two did not.

The participants then crossed over to the other side of the highway were monitoring wells and vaults were located. The wells and vaults were in good condition.

3. DISCUSSION

The site inspection began at approximately 1015. The weather was sunny to partly cloudy and the temperature was approximately 51ºF at 1015. The issues as described by the site manager included:

- Declining water levels thereby reducing the amount of water that could be extracted and reinjected.
- Inconsistent power supply in the past that impacted the amount of down time of the remedy. This has been corrected with an uninterruptable power supply (UPS) and will be further improved with automation.
- Installation of programmable logic controller (PLC) and automation to reduce on-site operations by personnel. This should be implemented within a year.
- At the old groundwater treatment plant - removal of the cleaning pad curb and installation of a French drain to allow for drainage of water being collected at the cleaning pad.
- Replacement of gaskets and valves for the phase 3 treatment system to reduce leaking.

No further specifics were noted in regards to impacts or changes to the remedy. No issues noted during this site visit affect the protectiveness of the remedy.

The site inspection ended at 1415.

4. ACTIONS

The USACE will incorporate information obtained from the site visit into the Five Year Review report.

Jayson Osbourne	Blair Kinser
Remediation Biologist	Environmental Engineer
Seattle USACE EN-TS-ET	Seattle USACE EN-TS-ET

Site Visit Map

Site Visit Photos

Figure 1: Interior of pump and treat system

Figure 2: Interior of pump and treat building

Figure 3: Water accumulation at exterior of pump and treat building

Figure 4: RCRA impoundment vegetated cap

Figure 4: Detail of incidental rodent burrowing on RCRA cap.

Figure 5: drainage swale

Figure 6: infiltration ponds

Figure 7: culvert under highway

Figure 8: Cold weather protection measures

Figure 9: Secured monitoring well

Figure 10: Recycling yard in background

Figure 11: ISB injection skid

Figure 12: signage on exterior fencing

Figure 13: IBS control area

Figure 14: asphalt cap

Figure 15: Biohazard empty container at recycling facility

Figure 16: Vineyard adjacent to plume area

Appendix J: Data from October 2015 and April 2016 Groundwater Sampling Event

TABLE OF CONTENTS

CLIENT: **CB&I**

PROJECT: **SELMA BI-ANNUAL EPA**

SDG: **15J195**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1004
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	METHOD 3010A/6010B	7000 – 7015
WET	METHOD 7199	8000 – 8005
OTHERS	**	9000 –

** - Not Requested

EMAX
LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 11-09-2015
EMAX Batch No.: 15J195

Attn: Melanie Gonzalez

CB&I
420 Exchange Road, Suite 150
Irvine, CA 92602

Subject: Laboratory Report
Project: Selma Bi-Annual EPA

Enclosed is the Laboratory report for samples received on 10/29/15.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
500167-0014	J195-01	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0024	J195-02	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0013	J195-03	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0006	J195-04	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0019	J195-05	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0012	J195-06	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0025	J195-07	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0022	J195-08	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0023	J195-09	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0021	J195-10	10/28/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Caspar J. Pang
Laboratory Director

This report is confidential and intended solely for the use of the individual or entity to whom it is addressed. This report shall not be reproduced except in full or without the written approval of EMAX.

EMAX certifies that results included in this report meets all NELAC & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number E871112
L-A-B Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

①

Lab No.: 15J195

Ref. Document #: 500167 -

CHAIN OF CUSTODY

Page 3 of

Company Name:	CB&I Federal Services, LLC
Address:	420 Exchange Road, Suite 150
City / State / Zip:	Irvine, CA 92602
Manager:	Steve Pierce
Phone:	415-512-2416
Send Report To:	ATTN: Melanie Gonzalez
Phone:	714-669-7016
Address:	420 Exchange Road, Suite 150
City:	Irvine, CA 92602
Project Contact:	**Melanie Gonzalez**
Phone/FAX Number:	714-669-7016 / 714-669-7060

Project Number:	500167.02510020
Project Name:	Selma SPT-Triannual
Project Location:	Selma, CA
Purchase Order #:	1115906
Lab Destination:	EMAX
Lab Contact:	Richard Beauvil
Lab Phone #:	310-618-8889 x118
Lab Fax:	310-618-0818

Program: Navy [ ] EPA [X] DOT [ ] USACE [ ] NPDES [ ] RCRA [ ] DTSC [ ]

	Shaw Sample Number	Sample Identification	Collection Information: Date	Time	Method	Matrix	# of Containers	QC Level	PRESERVATION: (1) HCL	(2) NaOH	(3) HNO_3	(4) H2SO4	(5) Ice (6° C)	(7) Ammonium Sulfate/ Ammonium Hydroxide Buffer	HEXAVALENT CHROMIUM (SW7199)	DISSOLVED CHROMIUM (6010B)			Field pH Hexavalent Chromium	Field pH of Dissolved Chromium			MS/MSD = M, Field Duplicate = D
															Requesting Testing Program: 7	~~1~~							
1	500167-0014	12914 S. Mc Call Ave	10-28-15	0910	G	G.W	2	III					X	~~X~~	X	X			9.59				
2	500167-0024	12868 S. Mc Call Ave	↓	0925	G		2	III					X		X	X			9.49				
3	500167-0013	12858 S. Mc Call Ave		0930	G		2	III					X		X	X			9.28				
4	500167-0006	9919 E. MT View Ave		1000	G		2	III					X		X	X			9.25				
5	500167-0019	IW-15		1005	G		2	III					X		X	X			9.25				
6	500167-0012	IW-9B		1030	G		2	III					X		X	X			9.29				
7	500167-0025	12813 S. Mc Call Ave		1045	G		2	III					X		X	X			9.38				
8	500167-0022	12553 S Mc Call Ave		1225 ~~1223~~	G		2	III					X		X	X			9.53				
9	500167-0023	12578 S. Mc Call Ave		1258	G		2	III					X		X	X			9.49				
10	~~ER-1015~~ 500167-0021	Equipment rinsate	↓	1535	G		2	III					X		X	X			9.29				

Special Instructions: Proj: 500167

GSO Tracking Number(s): 105 42 1662

Sampler(s) Name(s): R. Ibarra / L. Nielsen

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[signature]	10/28/15		GSO		
GSO					
			[signature]	10/29/15	9:30

Turnaround Time: 21 Days | Normal | Rush

Method Codes

C = Composite | G = Grab | LF - Low Flow

Matrix Codes

BW = Blank Water | SO =Soil | GW = Ground Water | SL = Sludge | WW = Waste Water | CP = Chip Samples | SW = Surface Water | WP = Wipe Samples | LIQ = Other Liquid | A = Air Sample | SOL = Other Solid | W = Water Sample

1-3.6°C

1001

SAMPLE RECEIPT FORM 1 Reference Number: SM02.7.3

Type of Delivery	Airbill / Tracking Number	ECN 15J195
☐ Fedex ☐ UPS ☑ GSO ☐ Others	1054 21 661	Recipient Miguel
☐ EMAX Courier ☐ Client Delivery		Date 10/29/15 Time 9:30

COC INSPECTION

☑ Client Name	☑ Client PM/FC	☑ Sampler Name	☑ Sampling Date/Time	☑ Sample ID	☑ Matrix
☑ Address	☑ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☑ Preservative (if any)	☑ TAT
Safety Issues (if any)	☐ High concentrations expected	☐ From Superfund Site	☐ Rad screening required		

Note: Corrections on COC not Dated

PACKAGING INSPECTION

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☑ Custody Seal	☐ Intact	☐ Damaged		
Packaging	☑ Bubble Pack	☐ Styrofoam	☐ Popcorn	☐ Sufficient	☐ _____
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 3.6 °C	☐ Cooler 2 _____ °C	☐ Cooler 3 _____ °C	☐ Cooler 4 _____ °C	☐ Cooler 5 _____ °C
	☐ Cooler 6 _____ °C	☐ Cooler 7 _____ °C	☐ Cooler 8 _____ °C	☐ Cooler 9 _____ °C	☐ Cooler 10 _____ °C
Thermometer:	*A - S/N* _____	*B - S/N* 140252070	*C - S/N* 140252067	*D - S/N* _____	

FM 11/20/15

Comments: ☐ **Temperature is out of range. PM was informed IMMEDIATELY.**

Note:

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
2, 7	3-4, 13-14	D3	Label missing Ave at end of	R8
↓ ↓	↓ ↓	↓	Sample ID as indicated on COC	
5	9-10	D3	Label reads IW-15 (9919 E. MTAVE)	
↓ ↓	↓ ↓	↓	vs COC IW-15	
6	11-12	D3	Label reads IW-9B (12813 McCall Ave)	
↓ ↓	↓ ↓	↓	vs COC IW-9B	
1	1-2	D7	Label date 8/28/15	R1
1-10		D18	All Containers for 7199 + Diss Cr are preserved. COC indicates iced only.	R8

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

NOTES/OBSERVATIONS: No Filter info for dissolved chromium on label / COC. RB 10/29/15

LEGEND:

☐ **Continue to next page.**

Code	Description- Sample Management	Code	Description-Sample Management	Code	Description-Sample Management
D1	Analysis is not indicated in _____	D13	Out of Holding Time	R1	Proceed as indicated in ☒ COC ☐ Label
D2	Analysis mismatch COC vs label	D14	Bubble is >6mm	R2	Refer to attached instruction
D3	Sample ID mismatch COC vs label	D15	No trip blank in cooler	R3	Cancel the analysis
D4	Sample ID is not indicated in _____	D16	Preservation not indicated in _____	R4	Use vial with smallest bubble first
D5	Container -[improper] [leaking] [broken]	D17	Preservation mismatch COC vs label	R5	Log-in with latest sampling date and time+1 min
D6	Date/Time is not indicated in _____	D18	Insufficient chemical preservative	R6	Adjust pH as necessary
D7	Date/Time mismatch COC vs label	D19	Insufficient Sample	R7	Filter and preserved as necessary
D8	Sample listed in COC is not received	D20	No filtration info for dissolved analysis	R8	Informed Client
D9	Sample received is not listed in COC	D21	No sample for moisture determination	R9	
D10	No initial/date on corrections in COC/label	D22		R10	
D11	Container count mismatch COC vs received	D23		R11	
D12	Container size mismatch COC vs received	D24		R12	

REVIEWS:

Sample Labeling [signature] **Date** 10/29/15 | 10/29/15

SRF [signature] **Date** 10/29/15

PM RB **Date** 10/29/15

GSO
GOLDEN STATE OVERNIGHT

1-800-322-5555
WWW.GSO.COM

SHIPPING AIR BILL

PACKAGE LABEL

FROM

DATE 10/28/97
COMPANY CBI
ADDRESS 949 Golden State Blvd
ADDRESS
STE/ ROOM
CITY Selma, CA
ZIP CODE 93662
SENDERS NAME Ramon
PHONE NUMBER 559-300-6313

TO 2

COMPANY Emux
NAME Richard
PHONE NUMBER (310) 618-8889
ADDRESS 1835 W. 205th ST.
ADDRESS
STE/ ROOM
CITY Torrance, CA
ZIP CODE 90501

3 YOUR INTERNAL BILLING REFERENCE WILL APPEAR ON YOUR INVOICE 137194

SPECIAL INSTRUCTIONS HIGH

4 PACKAGE INFORMATION (2)
- [ ] LETTER (MAX 8 OZ)
- [x] PACKAGE (WT) 10lb
- [ ] DECLARED VALUE $
- [ ] COD AMOUNT $ (CASH NOT ACCEPTED)

5 DELIVERY SERVICE
- [x] PRIORITY OVERNIGHT BY 10:30 AM
- [ ] EARLY PRIORITY BY 8:00 AM
- [ ] SATURDAY DELIVERY

*DELIVERY TIMES MAY BE LATER IN SOME AREAS • CONSULT YOUR SERVICE GUIDE OR CALL GOLDEN STATE OVERNIGHT.

6 RELEASE SIGNATURE
SIGN TO AUTHORIZE DELIVERY WITHOUT OBTAINING SIGNATURE

7

8 PICK UP INFORMATION 6 08 1055
TIME DRIVER # ROUTE #

105421661

PEEL OFF HERE

105421661

9 GSO TRACKING NUMBER

1003

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than LOQ/RL but greater than LOD/MDL/DL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

CB&I

SELMA BI-ANNUAL EPA

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

SDG#: 15J195

CASE NARRATIVE

Client : CB&I

Project: SELMA BI-ANNUAL EPA

SDG : 15J195

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

A total of ten (10) water samples were received on 10/29/15 to be analyzed for Dissolved Chromium by Trace ICP in accordance with Method 3010A/6010B and project specific requirements.

Holding Time
Samples were digested and analyzed within the prescribed holding time.

Calibration
Calibration was performed as prescribed by the method and was verified using a secondary source (ICV). All calibration requirements were within acceptance criteria.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one (1) method blank was analyzed. IPJ036WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of LCS/LCD was analyzed. IPJ036WL/IPJ036WC was within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample
Matrix spike sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of MS/MSD was analyzed. Chromium was within MS QC limits in J195-01M/S. Refer to Matrix QC summary form for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

LAB CHRONICLE
DISSOLVED CHROMIUM BY TRACE ICP

Client : CB&I
Project : SELMA BI-ANNUAL EPA

SDG NO. : 15J195
Instrument ID : T-ID8

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	IPJ036WB	1	NA	11/02/1515:45	10/30/1514:06	ID8K001022	ID8K001020	IPJ036W	Method Blank
LCS1W	IPJ036WL	1	NA	11/02/1515:48	10/30/1514:06	ID8K001023	ID8K001020	IPJ036W	Lab Control Sample (LCS)
LCD1W	IPJ036WC	1	NA	11/02/1515:51	10/30/1514:06	ID8K001024	ID8K001020	IPJ036W	LCS Duplicate
500167-0014	J195-01	1	NA	11/02/1516:15	10/30/1514:06	ID8K001032	ID8K001029	IPJ036W	Field Sample
500167-0014MS	J195-01M	1	NA	11/02/1516:21	10/30/1514:06	ID8K001034	ID8K001029	IPJ036W	Matrix Spike Sample (MS)
500167-0014MSD	J195-01S	1	NA	11/02/1516:24	10/30/1514:06	ID8K001035	ID8K001029	IPJ036W	MS Duplicate (MSD)
500167-0024	J195-02	1	NA	11/02/1516:27	10/30/1514:06	ID8K001036	ID8K001029	IPJ036W	Field Sample
500167-0013	J195-03	1	NA	11/02/1516:30	10/30/1514:06	ID8K001037	ID8K001029	IPJ036W	Field Sample
500167-0006	J195-04	1	NA	11/02/1516:33	10/30/1514:06	ID8K001038	ID8K001029	IPJ036W	Field Sample
500167-0019	J195-05	1	NA	11/02/1516:36	10/30/1514:06	ID8K001039	ID8K001029	IPJ036W	Field Sample
500167-0012	J195-06	1	NA	11/02/1516:39	10/30/1514:06	ID8K001040	ID8K001029	IPJ036W	Field Sample
500167-0025	J195-07	1	NA	11/02/1516:48	10/30/1514:06	ID8K001043	ID8K001041	IPJ036W	Field Sample
500167-0022	J195-08	1	NA	11/02/1516:51	10/30/1514:06	ID8K001044	ID8K001041	IPJ036W	Field Sample
500167-0023	J195-09	1	NA	11/02/1516:54	10/30/1514:06	ID8K001045	ID8K001041	IPJ036W	Field Sample
500167-0021	J195-10	1	NA	11/02/1516:57	10/30/1514:06	ID8K001046	ID8K001041	IPJ036W	Field Sample

FN - Filename
% Moist - Percent Moisture

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 09:10
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0014	Date Analyzed:	11/02/15 16:15
Lab Samp ID:	J195-01	Dilution Factor:	1
Lab File ID:	ID8K001032	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	2.68J	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 09:25
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0024	Date Analyzed:	11/02/15 16:27
Lab Samp ID:	J195-02	Dilution Factor:	1
Lab File ID:	ID8K001036	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	13.4	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 09:30
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0013	Date Analyzed:	11/02/15 16:30
Lab Samp ID:	J195-03	Dilution Factor:	1
Lab File ID:	ID8K001037	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	11.0	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 10:00
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0006	Date Analyzed:	11/02/15 16:33
Lab Samp ID:	J195-04	Dilution Factor:	1
Lab File ID:	ID8K001038	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	10.3	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 10:05
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0019	Date Analyzed:	11/02/15 16:36
Lab Samp ID:	J195-05	Dilution Factor:	1
Lab File ID:	ID8K001039	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	7.67	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 10:30
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0012	Date Analyzed:	11/02/15 16:39
Lab Samp ID:	J195-06	Dilution Factor:	1
Lab File ID:	ID8K001040	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001029	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	19.8	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 10:45
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0025	Date Analyzed:	11/02/15 16:48
Lab Samp ID:	J195-07	Dilution Factor:	1
Lab File ID:	ID8K001043	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001041	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	7.36	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 12:25
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0022	Date Analyzed:	11/02/15 16:51
Lab Samp ID:	J195-08	Dilution Factor:	1
Lab File ID:	ID8K001044	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001041	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	3.83J	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 12:58
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0023	Date Analyzed:	11/02/15 16:54
Lab Samp ID:	J195-09	Dilution Factor:	1
Lab File ID:	ID8K001045	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001041	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	3.31J	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/28/15 15:35
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	500167-0021	Date Analyzed:	11/02/15 16:57
Lab Samp ID:	J195-10	Dilution Factor:	1
Lab File ID:	ID8K001046	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001041	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	ND	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	NA
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/30/15
SDG NO.	: 15J195	Date Extracted:	10/30/15 14:06
Sample ID:	MBLK1W	Date Analyzed:	11/02/15 15:45
Lab Samp ID:	IPJ036WB	Dilution Factor:	1
Lab File ID:	ID8K001022	Matrix :	WATER
Ext Btch ID:	IPJ036W	% Moisture :	NA
Calib. Ref.:	ID8K001020	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	ND	5.00	1.50	3.00

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: CB&I
PROJECT: SELMA BI-ANNUAL EPA
SDG NO.: 15J195
METHOD: METHOD 3010A/6010B

MATRIX:	WATER			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	MBLK1W				
CONTROL NO.:	IPJ036WB	IPJ036WL	IPJ036WC		
LAB FILE ID:	ID8K001022	ID8K001023	ID8K001024		
DATIME EXTRCTD:	10/30/1514:06	10/30/1514:06	10/30/1514:06	DATE COLLECTED:	NA
DATIME ANALYZD:	11/02/1515:45	11/02/1515:48	11/02/1515:51	DATE RECEIVED:	10/30/15
PREP. BATCH:	IPJ036W	IPJ036W	IPJ036W		
CALIB. REF:	ID8K001020	ID8K001020	ID8K001020		

ACCESSION:

PARAMETER	BLNK RSLT ug/L	SPIKE AMT ug/L	BS RSLT ug/L	BS % REC	SPIKE AMT ug/L	BSD RSLT ug/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Chromium	ND	500	513	103	500	503	101	2	80-120	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: CB&I
PROJECT: SELMA BI-ANNUAL EPA
SDG NO.: 15J195
METHOD: METHOD 3010A/6010B

MATRIX:	WATER			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	500167-0014				
CONTROL NO.:	J195-01	J195-01M	J195-01S		
LAB FILE ID:	ID8K001032	ID8K001034	ID8K001035		
DATIME EXTRCTD:	10/30/1514:06	10/30/1514:06	10/30/1514:06	DATE COLLECTED:	10/28/15 09:10
DATIME ANALYZD:	11/02/1516:15	11/02/1516:21	11/02/1516:24	DATE RECEIVED:	10/29/15
PREP. BATCH:	IPJ036W	IPJ036W	IPJ036W		
CALIB. REF:	ID8K001029	ID8K001029	ID8K001029		

ACCESSION:

PARAMETER	SMPL RSLT ug/L	SPIKE AMT ug/L	MS RSLT ug/L	MS % REC	SPIKE AMT ug/L	MSD RSLT ug/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Chromium	ND	500	499	100	500	496	99	1	75-125	20

LABORATORY REPORT FOR

CB&I

SELMA BI-ANNUAL EPA

METHOD 7199
HEXAVALENT CHROMIUM

SDG#: 15J195

CASE NARRATIVE

Client : CB&I

Project: SELMA BI-ANNUAL EPA

SDG : 15J195

METHOD 7199
HEXAVALENT CHROMIUM

A total of ten (10) water samples were received on 10/29/15 to be analyzed for Hexavalent Chromium in accordance with Method 7199 and project specific requirements.

Holding Time
Samples were analyzed within the prescribed holding time.

Calibration
Calibration was performed as prescribed by the method and was verified using a secondary source (ICV). All calibration requirements were within acceptance criteria.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, two (2) method blanks were analyzed. HCJ015WB and HCJ017WB were compliant to project requirement. Refer to sample result summary forms for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, two (2) sets of LCS/LCD were analyzed. HCJ015WL/HCJ015WC and HCJ017WL/HCJ017WC was within LCS limits. Refer to LCS summary forms for details.

Matrix QC Sample
Matrix spike sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of MS/MSD was analyzed. Hexavalent Chromium was within MS QC limits in J195-09M/S. Refer to Matrix QC summary form for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

METHOD 7199
HEXAVALENT CHROMIUM

Client : CB&I
Project : SELMA BI-ANNUAL EPA
Batch No. : 15J195

Matrix : WATER
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HCJ015WB	ND	1	NA	0.2	0.05	0.1	10/29/1521:41	NA	IJ31003	IJ31001	HCJ015W	NA	NA
LCS1W	HCJ015WL	1.99	1	NA	0.2	0.05	0.1	10/29/1522:02	NA	IJ31005	IJ31001	HCJ015W	NA	NA
LCD1W	HCJ015WC	1.94	1	NA	0.2	0.05	0.1	10/29/1522:22	NA	IJ31007	IJ31001	HCJ015W	NA	NA
500167-0021	J195-10	ND	1	NA	0.2	0.05	0.1	10/29/1522:54	NA	IJ31009	IJ31001	HCJ015W	10/28/1515:35	10/29/15
500167-0014	J195-01	1.51	1	NA	0.2	0.05	0.1	10/29/1523:46	NA	IJ31013	IJ31011	HCJ015W	10/28/1509:10	10/29/15
500167-0024	J195-02	8.71	1	NA	0.2	0.05	0.1	10/30/1500:06	NA	IJ31015	IJ31011	HCJ015W	10/28/1509:25	10/29/15
500167-0013	J195-03	7.70	1	NA	0.2	0.05	0.1	10/30/1500:27	NA	IJ31017	IJ31011	HCJ015W	10/28/1509:30	10/29/15
500167-0006	J195-04	7.60	1	NA	0.2	0.05	0.1	10/30/1500:48	NA	IJ31019	IJ31011	HCJ015W	10/28/1510:00	10/29/15
500167-0019	J195-05	7.02	1	NA	0.2	0.05	0.1	10/30/1501:09	NA	IJ31021	IJ31011	HCJ015W	10/28/1510:05	10/29/15
500167-0025	J195-07	5.20	1	NA	0.2	0.05	0.1	10/30/1502:22	NA	IJ31027	IJ31023	HCJ015W	10/28/1510:45	10/29/15
500167-0023	J195-09	2.11	1	NA	0.2	0.05	0.1	10/30/1503:03	NA	IJ31031	IJ31023	HCJ015W	10/28/1512:58	10/29/15
500167-0023MS	J195-09M	3.07	1	NA	0.2	0.05	0.1	10/30/1503:24	NA	IJ31033	IJ31023	HCJ015W	10/28/1512:58	10/29/15
500167-0023MSD	J195-09S	2.96	1	NA	0.2	0.05	0.1	10/30/1504:16	NA	IJ31037	IJ31035	HCJ015W	10/28/1512:58	10/29/15
MBLK2W	HCJ017WB	ND	1	NA	0.2	0.05	0.1	10/30/1512:07	NA	IJ32003	IJ32001	HCJ017W	NA	NA
LCS2W	HCJ017WL	1.76	1	NA	0.2	0.05	0.1	10/30/1512:28	NA	IJ32005	IJ32001	HCJ017W	NA	NA
LCD2W	HCJ017WC	1.80	1	NA	0.2	0.05	0.1	10/30/1512:49	NA	IJ32007	IJ32001	HCJ017W	NA	NA
500167-0022	J195-08	2.58	1	NA	0.2	0.05	0.1	10/30/1513:10	NA	IJ32009	IJ32001	HCJ017W	10/28/1512:25	10/29/15
500167-0012	J195-06I	16.3	10	NA	2	0.5	1	10/30/1513:30	NA	IJ32011	IJ32001	HCJ017W	10/28/1510:30	10/29/15

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : CB&I
PROJECT : SELMA BI-ANNUAL EPA
BATCH NO. : 15J195
METHOD : 7199

MATRIX : WATER % MOISTURE: NA

DILUTION FACTOR:	1	1	1
SAMPLE ID :	MBLK1W	LCS1W	LCD1W
LAB SAMPLE ID :	HCJ015WB	HCJ015WL	HCJ015WC
LAB FILE ID :	IJ31003	IJ31005	IJ31007
DATE PREPARED :	NA	NA	NA
DATE ANALYZED :	10/29/1521:41	10/29/1522:02	10/29/1522:22
PREP BATCH :	HCJ015W	HCJ015W	HCJ015W
CALIBRATION REF:	IJ31001	IJ31001	IJ31001

ACCESSION:

PARAMETER	MB RESULT (ug/L)	SPIKE AMT (ug/L)	BS RESULT (ug/L)	BS REC (%)	SPIKE AMT (ug/L)	BSD RESULT (ug/L)	BSD REC (%)	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Hexavalent Chromium	ND	2	1.99	100	2	1.94	97	3	80-120	20

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : CB&I
PROJECT : SELMA BI-ANNUAL EPA
BATCH NO. : 15J195
METHOD : 7199

MATRIX : WATER % MOISTURE: NA

DILUTION FACTOR:	1	1	1
SAMPLE ID :	MBLK2W	LCS2W	LCD2W
LAB SAMPLE ID :	HCJ017WB	HCJ017WL	HCJ017WC
LAB FILE ID :	IJ32003	IJ32005	IJ32007
DATE PREPARED :	NA	NA	NA
DATE ANALYZED :	10/30/1512:07	10/30/1512:28	10/30/1512:49
PREP BATCH :	HCJ017W	HCJ017W	HCJ017W
CALIBRATION REF:	IJ32001	IJ32001	IJ32001

ACCESSION:

PARAMETER	MB RESULT (ug/L)	SPIKE AMT (ug/L)	BS RESULT (ug/L)	BS REC (%)	SPIKE AMT (ug/L)	BSD RESULT (ug/L)	BSD REC (%)	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Hexavalent Chromium	ND	2	1.76	88	2	1.80	90	2	80-120	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT : CB&I
PROJECT : SELMA BI-ANNUAL EPA
BATCH NO. : 15J195
METHOD : 7199

MATRIX :	WATER		% MOISTURE: NA
DILUTION FACTOR:	1	1	1
SAMPLE ID :	500167-0023	500167-0023MS	500167-0023MSD
LAB SAMPLE ID :	J195-09	J195-09M	J195-09S
LAB FILE ID :	IJ31031	IJ31033	IJ31037
DATE PREPARED :	NA	NA	NA
DATE ANALYZED :	10/30/1503:03	10/30/1503:24	10/30/1504:16
PREP BATCH :	HCJ017W	HCJ017W	HCJ017W
CALIBRATION REF:	IJ32001	IJ32001	IJ32001

ACCESSION:

PARAMETER	PARENT RESULT (ug/L)	SPIKE AMT (ug/L)	MS RESULT (ug/L)	MS REC (%)	SPIKE AMT (ug/L)	MSD RESULT (ug/L)	MSD REC (%)	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Hexavalent Chromium	2.11	1	3.07	96	1	2.96	85	4	75-125	20

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CLIENT: **CB&I**

PROJECT: **SELMA BI-ANNUAL EPA**

SDG: **15J203**

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GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	**	5000 –
HPLC	**	6000 –
METALS	METHOD 3010A/6010B	7000 – 7010
WET	METHOD 7199	8000 – 8004
OTHERS	**	9000 –

** - Not Requested

EMAX
LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 11-09-2015
EMAX Batch No.: 15J203

Attn: Melanie Gonzalez

CB&I
420 Exchange Road, Suite 150
Irvine, CA 92602

Subject: Laboratory Report
Project: Selma Bi-Annual EPA

Enclosed is the Laboratory report for samples received on 10/29/15.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
500167-0026	J203-01	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0027	J203-02	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0028	J203-03	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0029	J203-04	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0030	J203-05	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0027MS	J203-02M	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM
500167-0027MSD	J203-02S	10/29/15	WATER	HEXAVALENT CHROMIUM BY IC DISSOLVED CHROMIUM

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Caspar J. Pang
Laboratory Director

This report is confidential and intended solely for the use of the individual or entity to whom it is addressed. This report shall not be reproduced except in full or without the written approval of EMAX.

EMAX certifies that results included in this report meets all NELAC & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number E871112
L-A-B Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

Lab No.: 15J203

Ref. Document #: 500167 -

CHAIN OF CUSTODY

Page 3 of 7

Company Name:	CB&I Federal Services, LLC
Address:	420 Exchange Road, Suite 150
City / State / Zip:	Irvine, CA 92602
Manager:	Steve Pierce
Phone:	415-512-2416
Send Report To:	ATTN: Melanie Gonzalez
Phone:	714-669-7016
Address:	420 Exchange Road, Suite 150
City:	Irvine, CA 92602
Project Contact:	Melanie Gonzalez
Phone/FAX Number:	714-669-7016 / 714-669-7060

Project Number:	500167.02510020
Project Name:	Selma SPT-Triannual
Project Location:	Selma, CA
Purchase Order #:	1115906
Lab Destination:	EMAX
Lab Contact:	Richard Beauvil
Lab Phone #:	310-618-8889 x118
Lab Fax:	310-618-0818

Program: Navy [ ] EPA [X] DOT [ ] USACE [ ] NPDES [ ] RCRA [ ] DTSC [ ]

PRESERVATION

Requesting Testing Program

	CBI Sample Number	Sample Identification	Collection Information: Date	Time	Method	Matrix	# of Containers	QC Level	(1) HCL	(2) NaOH	(3) HNO_3	(4) H2SO4	(5) Ice (6° C)	(7) Ammonium Sulfate/ Ammonium Hydroxide Buffer	HEXAVALENT CHROMIUM (SW7199)	DISSOLVED CHROMIUM (6010B)			Field pH Hexavalent Chromium	Field pH of Dissolved Chromium			MS/MSD = M, Field Duplicate = D
1	500167-0026	IW-17B	10/29/15	0745	G	GW	2						X	X	X	X			9.61				
2	500167-0027	13247 S. McCall Ave	↓	0750	↓	↓	6						X		X	X			9.54				M
3	500167-0028	13247 S. McCall Ave		0800			2						X		X	X			9.46				D
4	500167-0029	IW-13490		0845			2						X		X	X			9.40				
5	500167-0030	Equipment rinsate	↓	1215	↓	↓	2						X		X	X			9.30				

Special Instructions:

GSO Tracking Number(s):

Sampler(s) Name(s): R. Ibarra / L. Nielsen

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[signature]	10/29/15	1655	GSO [signature]	10/29/15	
Relinquished By: GSO [signature]			Received By:		
Relinquished By:			Received By: [signature]	10/29/15	16:55

Turnaround Time: 21 Days | Normal | Rush

Method Codes

C = Composite | G = Grab

LF - Low Flow

Matrix Codes

BW = Blank Water | SO = Soil

GW = Ground Water | SL = Sludge

WW = Waste Water | CP = Chip Samples

SW = Surface Water | WP = Wipe Samples

LIQ = Other Liquid | A = Air Sample

SOL = Other Solid | W = Water Sample

Temp = 2.1°C

1001

Reference Number: SM02.7.3

SAMPLE RECEIPT FORM 1

Type of Delivery	Airbill / Tracking Number	ECN 15J203
☐ Fedex ☐ UPS ☐ GSO ☐ Others		Recipient Miguel
☑ EMAX Courier ☑ Client Delivery		Date 10/29/15 Time 16:55

COC INSPECTION

☑ Client Name	☑ Client PM/FC	☑ Sampler Name	☑ Sampling Date/Time	☑ Sample ID	☑ Matrix
☑ Address	☑ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☑ Preservative (if any)	☑ TAT
Safety Issues (if any)	☐ High concentrations expected	☐ From Superfund Site	☐ Rad screening required		

Note: _____

PACKAGING INSPECTION

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☐ Custody Seal	☑ Intact	☐ Damaged		
Packaging	☐ Bubble Pack	☐ Styrofoam	☐ Popcorn	☑ Sufficient	☑ Plastic Bag
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 2.1 °C	☐ Cooler 2 ____ °C	☐ Cooler 3 ____ °C	☐ Cooler 4 ____ °C	☐ Cooler 5 ____ °C
	☐ Cooler 6 ____ °C	☐ Cooler 7 ____ °C	☐ Cooler 8 ____ °C	☐ Cooler 9 ____ °C	☐ Cooler 10 ____ °C

Thermometer: A - S/N _____ B - S/N 140252070 C - S/N 140252067 D - S/N _____

FM 1/20/15

Comments: ☐ Temperature is out of range. PM was informed IMMEDIATELY.

Note: _____

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
1-5	1-14	D10		R8
2, 3	3-8, 10	D3	Are missing from Sample ID on	↓
↓ ↓	↓ ↓	↓	label	
1-5	1-14	D1		
4	11	D18	Analysis Hex. Chromium pH=7 [illegible]	

10/29/15 RB 10/29

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

NOTES/OBSERVATIONS: COC indicates all samples are acid only, but they are preserved accordingly.
No filter info for Dissolved Chromium.

☐ Continue to next page.

LEGEND:

Code	Description- Sample Management	Code	Description-Sample Management	Code	Description-Sample Management
D1	Analysis is not indicated in label	D13	Out of Holding Time	R1	Proceed as indicated in ☐ COC ☐ Label
D2	Analysis mismatch COC vs label	D14	Bubble is >6mm	R2	Refer to attached instruction
D3	Sample ID mismatch COC vs label	D15	No trip blank in cooler	R3	Cancel the analysis
D4	Sample ID is not indicated in _____	D16	Preservation not indicated in _____	R4	Use vial with smallest bubble first
D5	Container -[improper] [leaking] [broken]	D17	Preservation mismatch COC vs label	R5	Log-in with latest sampling date and time+1 min
D6	Date/Time is not indicated in _____	D18	Insufficient chemical preservative	R6	Adjust pH as necessary
D7	Date/Time mismatch COC vs label	D19	Insufficient Sample	R7	Filter and preserved as necessary
D8	Sample listed in COC is not received	D20	No filtration info for dissolved analysis	R8	Informed Client
D9	Sample received is not listed in COC	D21	No sample for moisture determination	R9	
D10	No initial/date on corrections in COC/label	D22		R10	
D11	Container count mismatch COC vs received	D23		R11	
D12	Container size mismatch COC vs received	D24		R12	

REVIEWS:

Sample Labeling Cynthia Date 10/29/15 10/29/15

SRF Cynthia Date 10/29/15

PM RB Date 10/29/15

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than LOQ/RL but greater than LOD/MDL/DL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

CB&I

SELMA BI-ANNUAL EPA

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

SDG#: 15J203

CASE NARRATIVE

Client : CB&I

Project: SELMA BI-ANNUAL EPA

SDG : 15J203

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

A total of five (5) water samples were received on 10/29/15 to be analyzed for Dissolved Chromium by Trace ICP in accordance with Method 3010A/6010B and project specific requirements.

Holding Time
Samples were digested and analyzed within the prescribed holding time.

Calibration
Calibration was performed as prescribed by the method and was verified using a secondary source (ICV). All calibration requirements were within acceptance criteria.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one (1) method blank was analyzed. IPK002WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of LCS/LCD was analyzed. IPK002WL/IPK002WC was within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample
Matrix spike sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of MS/MSD was analyzed. Chromium was within MS QC limits in J203-02M/S. Refer to Matrix QC summary form for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

LAB CHRONICLE
DISSOLVED CHROMIUM BY TRACE ICP

Client : CB&I
Project : SELMA BI-ANNUAL EPA

SDG NO. : 15J203
Instrument ID : T-ID8

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	IPK002WB	1	NA	11/02/1518:49	11/02/1512:38	ID8K001057	ID8K001055	IPK002W	Method Blank
LCS1W	IPK002WL	1	NA	11/02/1518:52	11/02/1512:38	ID8K001058	ID8K001055	IPK002W	Lab Control Sample (LCS)
LCD1W	IPK002WC	1	NA	11/02/1518:55	11/02/1512:38	ID8K001059	ID8K001055	IPK002W	LCS Duplicate
500167-0027	J203-02	1	NA	11/02/1519:28	11/02/1512:38	ID8K001070	ID8K001067	IPK002W	Field Sample
500167-0027MS	J203-02M	1	NA	11/02/1519:34	11/02/1512:38	ID8K001072	ID8K001067	IPK002W	Matrix Spike Sample (MS)
500167-0027MSD	J203-02S	1	NA	11/02/1519:37	11/02/1512:38	ID8K001073	ID8K001067	IPK002W	MS Duplicate (MSD)
500167-0026	J203-01	1	NA	11/02/1519:40	11/02/1512:38	ID8K001074	ID8K001067	IPK002W	Field Sample
500167-0028	J203-03	1	NA	11/02/1519:43	11/02/1512:38	ID8K001075	ID8K001067	IPK002W	Field Sample
500167-0029	J203-04	1	NA	11/02/1519:46	11/02/1512:38	ID8K001076	ID8K001067	IPK002W	Field Sample
500167-0030	J203-05	1	NA	11/02/1519:50	11/02/1512:38	ID8K001077	ID8K001067	IPK002W	Field Sample

FN - Filename
% Moist - Percent Moisture

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/29/15 07:45
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	500167-0026	Date Analyzed:	11/02/15 19:40
Lab Samp ID:	J203-01	Dilution Factor:	1
Lab File ID:	ID8K001074	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001067	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	11.9	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/29/15 07:50
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	500167-0027	Date Analyzed:	11/02/15 19:28
Lab Samp ID:	J203-02	Dilution Factor:	1
Lab File ID:	ID8K001070	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001067	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	6.82	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/29/15 08:00
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	500167-0028	Date Analyzed:	11/02/15 19:43
Lab Samp ID:	J203-03	Dilution Factor:	1
Lab File ID:	ID8K001075	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001067	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	7.00	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/29/15 08:45
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	500167-0029	Date Analyzed:	11/02/15 19:46
Lab Samp ID:	J203-04	Dilution Factor:	1
Lab File ID:	ID8K001076	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001067	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	2.38J	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	10/29/15 12:15
Project	: SELMA BI-ANNUAL EPA	Date Received:	10/29/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	500167-0030	Date Analyzed:	11/02/15 19:50
Lab Samp ID:	J203-05	Dilution Factor:	1
Lab File ID:	ID8K001077	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001067	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	ND	5.00	1.50	3.00

METHOD 3010A/6010B
DISSOLVED CHROMIUM BY TRACE ICP

Client	: CB&I	Date Collected:	NA
Project	: SELMA BI-ANNUAL EPA	Date Received:	11/02/15
SDG NO.	: 15J203	Date Extracted:	11/02/15 12:38
Sample ID:	MBLK1W	Date Analyzed:	11/02/15 18:49
Lab Samp ID:	IPK002WB	Dilution Factor:	1
Lab File ID:	ID8K001057	Matrix :	WATER
Ext Btch ID:	IPK002W	% Moisture :	NA
Calib. Ref.:	ID8K001055	Instrument ID :	EMAXTID8

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Chromium	ND	5.00	1.50	3.00

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: CB&I
PROJECT: SELMA BI-ANNUAL EPA
SDG NO.: 15J203
METHOD: METHOD 3010A/6010B

MATRIX:	WATER			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	MBLK1W				
CONTROL NO.:	IPK002WB	IPK002WL	IPK002WC		
LAB FILE ID:	ID8K001057	ID8K001058	ID8K001059		
DATIME EXTRCTD:	11/02/1512:38	11/02/1512:38	11/02/1512:38	DATE COLLECTED:	NA
DATIME ANALYZD:	11/02/1518:49	11/02/1518:52	11/02/1518:55	DATE RECEIVED:	11/02/15
PREP. BATCH:	IPK002W	IPK002W	IPK002W		
CALIB. REF:	ID8K001055	ID8K001055	ID8K001055		

ACCESSION:

PARAMETER	BLNK RSLT ug/L	SPIKE AMT ug/L	BS RSLT ug/L	BS % REC	SPIKE AMT ug/L	BSD RSLT ug/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Chromium	ND	500	491	98	500	487	97	1	80-120	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: CB&I
PROJECT: SELMA BI-ANNUAL EPA
SDG NO.: 15J203
METHOD: METHOD 3010A/6010B

MATRIX:	WATER			% MOISTURE:	NA
DILTN FACTR:	1	1	1		
SAMPLE ID:	500167-0027				
CONTROL NO.:	J203-02	J203-02M	J203-02S		
LAB FILE ID:	ID8K001070	ID8K001072	ID8K001073		
DATIME EXTRCTD:	11/02/1512:38	11/02/1512:38	11/02/1512:38	DATE COLLECTED:	10/29/15 07:50
DATIME ANALYZD:	11/02/1519:28	11/02/1519:34	11/02/1519:37	DATE RECEIVED:	10/29/15
PREP. BATCH:	IPK002W	IPK002W	IPK002W		
CALIB. REF:	ID8K001067	ID8K001067	ID8K001067		

ACCESSION:

PARAMETER	SMPL RSLT ug/L	SPIKE AMT ug/L	MS RSLT ug/L	MS % REC	SPIKE AMT ug/L	MSD RSLT ug/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Chromium	6.82	500	466	92	500	475	94	2	75-125	20

LABORATORY REPORT FOR

CB&I

SELMA BI-ANNUAL EPA

METHOD 7199
HEXAVALENT CHROMIUM

SDG#: 15J203

CASE NARRATIVE

Client : CB&I

Project: SELMA BI-ANNUAL EPA

SDG : 15J203

METHOD 7199
HEXAVALENT CHROMIUM

A total of five (5) water samples were received on 10/29/15 to be analyzed for Hexavalent Chromium in accordance with Method 7199 and project specific requirements.

Holding Time
Samples were analyzed within the prescribed holding time.

Calibration
Calibration was performed as prescribed by the method and was verified using a secondary source (ICV). All calibration requirements were within acceptance criteria.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one (1) method blank was analyzed. Hexavalent Chromium was not detected in HCJ017WB. Refer to sample result summary form for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of LCS/LCD was analyzed. HCJ017WL/HCJ017WC was within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample
Matrix spike sample was prepared and analyzed at a frequency required by the project. For this SDG, one (1) set of MS/MSD was analyzed. Hexavalent Chromium was within MS QC limits in J203-02M/S. Refer to Matrix QC summary form for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

METHOD 7199
HEXAVALENT CHROMIUM

Client : CB&I
Project : SELMA BI-ANNUAL EPA
Batch No. : 15J203

Matrix : WATER
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HCJ017WB	ND	1	NA	0.2	0.05	0.1	10/30/1512:07	NA	IJ32003	IJ32001	HCJ017W	NA	NA
LCS1W	HCJ017WL	1.76	1	NA	0.2	0.05	0.1	10/30/1512:28	NA	IJ32005	IJ32001	HCJ017W	NA	NA
LCD1W	HCJ017WC	1.80	1	NA	0.2	0.05	0.1	10/30/1512:49	NA	IJ32007	IJ32001	HCJ017W	NA	NA
500167-0026	J203-01	7.80	1	NA	0.2	0.05	0.1	10/30/1514:12	NA	IJ32015	IJ32013	HCJ017W	10/29/1507:45	10/29/15
500167-0028	J203-03	4.00	1	NA	0.2	0.05	0.1	10/30/1514:33	NA	IJ32017	IJ32013	HCJ017W	10/29/1508:00	10/29/15
500167-0029	J203-04	1.65	1	NA	0.2	0.05	0.1	10/30/1514:54	NA	IJ32019	IJ32013	HCJ017W	10/29/1508:45	10/29/15
500167-0030	J203-05	ND	1	NA	0.2	0.05	0.1	10/30/1515:15	NA	IJ32021	IJ32013	HCJ017W	10/29/1512:15	10/29/15
500167-0027	J203-02	4.20	1	NA	0.2	0.05	0.1	10/30/1515:56	NA	IJ32025	IJ32023	HCJ017W	10/29/1507:50	10/29/15
500167-0027MS	J203-02M	5.06	1	NA	0.2	0.05	0.1	10/30/1516:17	NA	IJ32027	IJ32023	HCJ017W	10/29/1507:50	10/29/15
500167-0027MSD	J203-02S	5.05	1	NA	0.2	0.05	0.1	10/30/1516:38	NA	IJ32029	IJ32023	HCJ017W	10/29/1507:50	10/29/15

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : CB&I
PROJECT : SELMA BI-ANNUAL EPA
BATCH NO. : 15J203
METHOD : 7199

MATRIX : WATER % MOISTURE: NA

DILUTION FACTOR:	1	1	1
SAMPLE ID :	MBLK1W	LCS1W	LCD1W
LAB SAMPLE ID :	HCJ017WB	HCJ017WL	HCJ017WC
LAB FILE ID :	IJ32003	IJ32005	IJ32007
DATE PREPARED :	NA	NA	NA
DATE ANALYZED :	10/30/1512:07	10/30/1512:28	10/30/1512:49
PREP BATCH :	HCJ017W	HCJ017W	HCJ017W
CALIBRATION REF:	IJ32001	IJ32001	IJ32001

ACCESSION:

PARAMETER	MB RESULT (ug/L)	SPIKE AMT (ug/L)	BS RESULT (ug/L)	BS REC (%)	SPIKE AMT (ug/L)	BSD RESULT (ug/L)	BSD REC (%)	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Hexavalent Chromium	ND	2	1.76	88	2	1.80	90	2	80-120	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT : CB&I
PROJECT : SELMA BI-ANNUAL EPA
BATCH NO. : 15J203
METHOD : 7199

MATRIX : WATER % MOISTURE: NA

DILUTION FACTOR:	1	1	1
SAMPLE ID :	500167-0027	500167-0027MS	500167-0027MSD
LAB SAMPLE ID :	J203-02	J203-02M	J203-02S
LAB FILE ID :	IJ32025	IJ32027	IJ32029
DATE PREPARED :	NA	NA	NA
DATE ANALYZED :	10/30/1515:56	10/30/1516:17	10/30/1516:38
PREP BATCH :	HCJ017W	HCJ017W	HCJ017W
CALIBRATION REF:	IJ32023	IJ32023	IJ32023

ACCESSION:

PARAMETER	PARENT RESULT (ug/L)	SPIKE AMT (ug/L)	MS RESULT (ug/L)	MS REC (%)	SPIKE AMT (ug/L)	MSD RESULT (ug/L)	MSD REC (%)	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Hexavalent Chromium	4.20	1	5.06	86	1	5.05	85	0.2	75-125	20

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: **4/28/2016**

Subject: **Analytical Testing Results - Project R16S45**
SDG: 16103A

From: **Peter Husby, Director**
EPA Region 9 Laboratory
EMD-3-1

To: **Grace Ma**
California Site Cleanup Section 3
SFD-7-3

Attached are the results from the analysis of samples from the **Selma Pressure Treatment April 2016 Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Melanie Gonzalez, C,B & I

Analyses included in this report:

Hexavalent Chromium by Ion Chromatography
Metals by ICP/MS
Metals by ICP/MS

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16103A
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	04/28/16 14:47
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
500167-0031	1604008-01	Water	04/11/16 14:22	04/12/16 10:50
500167-0031	1604008-02	Water	04/11/16 14:22	04/12/16 10:50
500167-0032	1604008-03	Water	04/11/16 15:23	04/12/16 10:50
500167-0032	1604008-04	Water	04/11/16 15:23	04/12/16 10:50
500167-0033	1604008-05	Water	04/11/16 15:32	04/12/16 10:50
500167-0033	1604008-06	Water	04/11/16 15:32	04/12/16 10:50
500167-0034	1604008-07	Water	04/11/16 13:00	04/12/16 10:50
500167-0034	1604008-08	Water	04/11/16 13:00	04/12/16 10:50
500167-0035	1604008-09	Water	04/11/16 16:19	04/12/16 10:50
500167-0035	1604008-10	Water	04/11/16 16:19	04/12/16 10:50

SDG ID 16103A

Work Order(s)

1604008

Hexavalent chrome: Samples were received at 9 degrees Celsius, above the recommended preservation range of 0 to 6 degrees Celsius. Data was not flagged as no impact is expected on the results.

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16103A
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 04/28/16 14:47
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1604008-01									**Water - Sampled: 04/11/16 14:22**
Sample ID: 500167-0031									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hexavalent Chromium		6.1		0.40	ug/L	B16D031	04/12/16	04/12/16	218.6
Lab ID: 1604008-02									**Water - Sampled: 04/11/16 14:22**
Sample ID: 500167-0031									**Dissolved Metals by EPA 200 Series Methods**
Chromium	RE1	5.2		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604008-03									**Water - Sampled: 04/11/16 15:23**
Sample ID: 500167-0032									**Total Metals by EPA 200 Series Methods**
Chromium		75		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Sample ID: 500167-0032									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hexavalent Chromium		72		0.40	"	B16D031	04/12/16	04/12/16	218.6
Lab ID: 1604008-04									**Water - Sampled: 04/11/16 15:23**
Sample ID: 500167-0032									**Dissolved Metals by EPA 200 Series Methods**
Chromium		82		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604008-05									**Water - Sampled: 04/11/16 15:32**
Sample ID: 500167-0033									**Total Metals by EPA 200 Series Methods**
Chromium		75		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Sample ID: 500167-0033									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hexavalent Chromium		72		0.40	"	B16D031	04/12/16	04/12/16	218.6
Lab ID: 1604008-06									**Water - Sampled: 04/11/16 15:32**
Sample ID: 500167-0033									**Dissolved Metals by EPA 200 Series Methods**
Chromium		76		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604008-07									**Water - Sampled: 04/11/16 13:00**
Sample ID: 500167-0034									**Total Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D041	04/18/16	04/19/16	200.8
Sample ID: 500167-0034									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hexavalent Chromium		0.28		0.10	"	B16D031	04/12/16	04/12/16	218.6
Lab ID: 1604008-08									**Water - Sampled: 04/11/16 13:00**
Sample ID: 500167-0034									**Dissolved Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604008-09									**Water - Sampled: 04/11/16 16:19**
Sample ID: 500167-0035									**Total Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D041	04/18/16	04/19/16	200.8
Sample ID: 500167-0035									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hexavalent Chromium		1.3		0.40	"	B16D031	04/12/16	04/12/16	218.6
Lab ID: 1604008-10									**Water - Sampled: 04/11/16 16:19**
Sample ID: 500167-0035									**Dissolved Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16103A
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	04/28/16 14:47
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B16D031 - - General Inorganic - Chromium VI										**Prepared & Analyzed: 04/12/16**
										Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control
Blank (B16D031-BLK1)										
Hexavalent Chromium	ND	U	0.02	ug/L						
LCS (B16D031-BS1)										
Hexavalent Chromium	4.84		0.02	ug/L	5.00		97	90-110		200
Matrix Spike (B16D031-MS1)		**Source: 1604008-09**								
Hexavalent Chromium	97.7		0.4	ug/L	100	1.28	96	90-110		20
Matrix Spike Dup (B16D031-MSD1)		**Source: 1604008-09**								
Hexavalent Chromium	98.3		0.4	ug/L	100	1.28	97	90-110	0.6	20
Batch B16D041 - 200 Series Digest - Metals, ICP/MS, Total										**Prepared: 04/18/16 Analyzed: 04/19/16**
										Total Metals by EPA 200 Series Methods - Quality Control
Blank (B16D041-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D041-BS1)										
Chromium	40.3		1	ug/L	40.0		101	85-115		200
Matrix Spike (B16D041-MS1)		**Source: 1604008-03**								
Chromium	116		1	ug/L	40.0	75.4	102	70-130		20
Matrix Spike Dup (B16D041-MSD1)		**Source: 1604008-03**								
Chromium	119		1	ug/L	40.0	75.4	110	70-130	3	20
Batch B16D045 - 200 Series Digest (Dissolved) - Metals, ICP/MS, Dissolved										**Prepared: 04/18/16 Analyzed: 04/19/16**
										Dissolved Metals by EPA 200 Series Methods - Quality Control
Blank (B16D045-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D045-BS1)										
Chromium	40.8		1	ug/L	40.0		102	85-115		200
Matrix Spike (B16D045-MS1)		**Source: 1604008-02RE1**								
Chromium	48.1		1	ug/L	40.0	5.21	107	70-130		20
Matrix Spike Dup (B16D045-MSD1)		**Source: 1604008-02RE1**								
Chromium	47.5		1	ug/L	40.0	5.21	106	70-130	1	20

United States Environmental Protection Agency
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Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16103A
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	04/28/16 14:47
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

Qualifiers and Comments

U	Not Detected
NR	Not Reported
RE1, RE2, etc:	Result is from a sample re-analysis.

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: **5/5/2016**

Subject: **Analytical Testing Results - Project R16S45**
SDG: 16105B

From: **Peter Husby, Director**
EPA Region 9 Laboratory
EMD-3-1

To: **Grace Ma**
California Site Cleanup Section 3
SFD-7-3

Attached are the results from the analysis of samples from the **Selma Pressure Treatment April 2016 Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Melanie Gonzalez, C,B & I

Analyses included in this report:

Metals by ICP/MS	Metals by ICP/MS

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16105B
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	05/05/16 16:45
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
500167-0036	1604012-02	Water	04/12/16 10:42	04/14/16 11:30
500167-0037	1604012-03	Water	04/12/16 12:35	04/14/16 11:30
500167-0038	1604012-05	Water	04/12/16 12:52	04/14/16 11:30
500167-0039	1604012-06	Water	04/12/16 12:55	04/14/16 11:30
500167-0040	1604012-07	Water	04/12/16 13:15	04/14/16 11:30
500167-0041	1604012-08	Water	04/12/16 14:12	04/14/16 11:30
500167-0042	1604012-10	Water	04/12/16 14:15	04/14/16 11:30
500167-0043	1604012-11	Water	04/12/16 14:16	04/14/16 11:30
500167-0044	1604012-12	Water	04/12/16 14:30	04/14/16 11:30
500167-0045	1604012-14	Water	04/12/16 15:00	04/14/16 11:30
500167-0046	1604012-15	Water	04/12/16 15:03	04/14/16 11:30
500167-0047	1604012-16	Water	04/12/16 15:07	04/14/16 11:30
500167-0048	1604012-18	Water	04/12/16 15:10	04/14/16 11:30
500167-0049	1604012-20	Water	04/12/16 15:20	04/14/16 11:30
500167-0051	1604012-21	Water	04/12/16 15:25	04/14/16 11:30
500167-0052	1604012-23	Water	04/12/16 16:10	04/14/16 11:30
500167-0053	1604012-24	Water	04/12/16 16:15	04/14/16 11:30
500167-0054	1604012-26	Water	04/12/16 16:26	04/14/16 11:30
500167-0055	1604012-27	Water	04/12/16 16:32	04/14/16 11:30
500167-0056	1604012-29	Water	04/12/16 16:40	04/14/16 11:30
500167-0057	1604012-30	Water	04/12/16 16:45	04/14/16 11:30
500167-0058	1604012-32	Water	04/12/16 17:00	04/14/16 11:30
500167-0059	1604012-33	Water	04/12/16 17:10	04/14/16 11:30
500167-0060	1604012-34	Water	04/12/16 19:30	04/14/16 11:30

SDG ID 16105B

Work Order(s)

1604012

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16105B
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:45
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1604012-02									**Water - Sampled: 04/12/16 10:42**
Sample ID: 500167-0036									**Dissolved Metals by EPA 200 Series Methods**
Chromium		4.7		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604012-03									**Water - Sampled: 04/12/16 12:35**
Sample ID: 500167-0037									**Total Metals by EPA 200 Series Methods**
Chromium		74		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-05									**Water - Sampled: 04/12/16 12:52**
Sample ID: 500167-0038									**Dissolved Metals by EPA 200 Series Methods**
Chromium		19		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604012-06									**Water - Sampled: 04/12/16 12:55**
Sample ID: 500167-0039									**Total Metals by EPA 200 Series Methods**
Chromium		19		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-07									**Water - Sampled: 04/12/16 13:15**
Sample ID: 500167-0040									**Total Metals by EPA 200 Series Methods**
Chromium		95		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-08									**Water - Sampled: 04/12/16 14:12**
Sample ID: 500167-0041									**Total Metals by EPA 200 Series Methods**
Chromium		1.4		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-10									**Water - Sampled: 04/12/16 14:15**
Sample ID: 500167-0042									**Dissolved Metals by EPA 200 Series Methods**
Chromium		3.0		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604012-11									**Water - Sampled: 04/12/16 14:16**
Sample ID: 500167-0043									**Total Metals by EPA 200 Series Methods**
Chromium		3.2		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-12									**Water - Sampled: 04/12/16 14:30**
Sample ID: 500167-0044									**Total Metals by EPA 200 Series Methods**
Chromium		92		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-14									**Water - Sampled: 04/12/16 15:00**
Sample ID: 500167-0045									**Dissolved Metals by EPA 200 Series Methods**
Chromium		6.6		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604012-15									**Water - Sampled: 04/12/16 15:03**
Sample ID: 500167-0046									**Total Metals by EPA 200 Series Methods**
Chromium		7.4		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-16									**Water - Sampled: 04/12/16 15:07**
Sample ID: 500167-0047									**Total Metals by EPA 200 Series Methods**
Chromium		7.7		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID: 1604012-18									**Water - Sampled: 04/12/16 15:10**
Sample ID: 500167-0048									**Dissolved Metals by EPA 200 Series Methods**
Chromium		6.6		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604012-20									**Water - Sampled: 04/12/16 15:20**

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16105B
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:45
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte		Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID:	**1604012-20**									**Water - Sampled: 04/12/16 15:20**
Sample ID:	**500167-0049**									**Dissolved Metals by EPA 200 Series Methods**
Chromium			33		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID:	**1604012-21**									**Water - Sampled: 04/12/16 15:25**
Sample ID:	**500167-0051**									**Total Metals by EPA 200 Series Methods**
Chromium			32		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID:	**1604012-23**									**Water - Sampled: 04/12/16 16:10**
Sample ID:	**500167-0052**									**Dissolved Metals by EPA 200 Series Methods**
Chromium			1.5		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID:	**1604012-24**									**Water - Sampled: 04/12/16 16:15**
Sample ID:	**500167-0053**									**Total Metals by EPA 200 Series Methods**
Chromium			2.2		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID:	**1604012-26**									**Water - Sampled: 04/12/16 16:26**
Sample ID:	**500167-0054**									**Dissolved Metals by EPA 200 Series Methods**
Chromium			6.1		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID:	**1604012-27**									**Water - Sampled: 04/12/16 16:32**
Sample ID:	**500167-0055**									**Total Metals by EPA 200 Series Methods**
Chromium			15		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID:	**1604012-29**									**Water - Sampled: 04/12/16 16:40**
Sample ID:	**500167-0056**									**Dissolved Metals by EPA 200 Series Methods**
Chromium			6.4		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID:	**1604012-30**									**Water - Sampled: 04/12/16 16:45**
Sample ID:	**500167-0057**									**Total Metals by EPA 200 Series Methods**
Chromium			7.3		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID:	**1604012-32**									**Water - Sampled: 04/12/16 17:00**
Sample ID:	**500167-0058**									**Dissolved Metals by EPA 200 Series Methods**
Chromium			48		1	ug/L	B16D045	04/18/16	04/19/16	200.8_Dissolved
Lab ID:	**1604012-33**									**Water - Sampled: 04/12/16 17:10**
Sample ID:	**500167-0059**									**Total Metals by EPA 200 Series Methods**
Chromium			41		1	ug/L	B16D041	04/18/16	04/19/16	200.8
Lab ID:	**1604012-34**									**Water - Sampled: 04/12/16 19:30**
Sample ID:	**500167-0060**									**Total Metals by EPA 200 Series Methods**
Chromium		RE1	ND	U	1	ug/L	B16D041	04/18/16	04/19/16	200.8

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Project Manager: Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16105B	
Project Number: R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:45	
Project: Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**		

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B16D041 - 200 Series Digest - Metals, ICP/MS, Total									**Prepared: 04/18/16 Analyzed: 04/19/16**	
									Total Metals by EPA 200 Series Methods - Quality Control	
Blank (B16D041-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D041-BS1)										
Chromium	40.3		1	ug/L	40.0		101	85-115		200
Matrix Spike (B16D041-MS2)		**Source: 1604012-12**								
Chromium	132		1	ug/L	40.0	91.9	100	70-130		20
Matrix Spike Dup (B16D041-MSD2)		**Source: 1604012-12**								
Chromium	135		1	ug/L	40.0	91.9	108	70-130	2	20
Batch B16D045 - 200 Series Digest (Dissolved) - Metals, ICP/MS, Dissolved									**Prepared: 04/18/16 Analyzed: 04/19/16**	
									Dissolved Metals by EPA 200 Series Methods - Quality Control	
Blank (B16D045-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D045-BS1)										
Chromium	40.8		1	ug/L	40.0		102	85-115		200
Matrix Spike (B16D045-MS2)		**Source: 1604012-20**								
Chromium	75.1		1	ug/L	40.0	33.2	105	70-130		20
Matrix Spike Dup (B16D045-MSD2)		**Source: 1604012-20**								
Chromium	75.3		1	ug/L	40.0	33.2	105	70-130	0.3	20

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Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16105B
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	05/05/16 16:45
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

Qualifiers and Comments

U	Not Detected
NR	Not Reported
RE1, RE2, etc:	Result is from a sample re-analysis.

United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: **5/5/2016**

Subject: **Analytical Testing Results - Project R16S45**
SDG: 16106A

From: **Peter Husby, Director**
EPA Region 9 Laboratory
EMD-3-1

To: **Grace Ma**
California Site Cleanup Section 3
SFD-7-3

Attached are the results from the analysis of samples from the **Selma Pressure Treatment April 2016 Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Melanie Gonzalez, C,B & I

Analyses included in this report:

Metals by ICP/MS	Metals by ICP/MS

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Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16106A
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	05/05/16 16:39
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
500167-0061	1604016-02	Water	04/13/16 10:20	04/15/16 11:00
500167-0062	1604016-04	Water	04/13/16 10:23	04/15/16 11:00
500167-0063	1604016-06	Water	04/13/16 11:02	04/15/16 11:00
500167-0064	1604016-07	Water	04/13/16 14:35	04/15/16 11:00
500167-0065	1604016-09	Water	04/13/16 14:38	04/15/16 11:00
500167-0066	1604016-10	Water	04/13/16 14:48	04/15/16 11:00
500167-0067	1604016-12	Water	04/13/16 14:52	04/15/16 11:00
500167-0068	1604016-13	Water	04/13/16 15:10	04/15/16 11:00
500167-0069	1604016-15	Water	04/13/16 15:12	04/15/16 11:00
500167-0070	1604016-16	Water	04/13/16 15:20	04/15/16 11:00
500167-0071	1604016-18	Water	04/13/16 15:25	04/15/16 11:00
500167-0072	1604016-20	Water	04/13/16 11:30	04/15/16 11:00
500167-0073	1604016-22	Water	04/13/16 16:58	04/15/16 11:00
500167-0074	1604016-23	Water	04/13/16 18:12	04/15/16 11:00
500167-0074A	1604016-25	Water	04/13/16 18:15	04/15/16 11:00
500167-0075	1604016-27	Water	04/14/16 08:40	04/15/16 11:00
500167-0075A	1604016-29	Water	04/14/16 08:42	04/15/16 11:00
500167-0076	1604016-31	Water	04/14/16 09:06	04/15/16 11:00
500167-0077	1604016-32	Water	04/14/16 09:26	04/15/16 11:00
500167-0078	1604016-34	Water	04/14/16 09:30	04/15/16 11:00
500167-0079	1604016-36	Water	04/14/16 10:47	04/15/16 11:00
500167-0080	1604016-38	Water	04/14/16 10:50	04/15/16 11:00
500167-0081	1604016-40	Water	04/14/16 14:07	04/15/16 11:00
500167-0082	1604016-42	Water	04/14/16 16:30	04/15/16 11:00
500167-0076A	1604016-44	Water	04/14/16 09:08	04/15/16 11:00

SDG ID 16106A

Work Order(s)

1604016

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
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Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16106A
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:39
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1604016-02									**Water - Sampled: 04/13/16 10:20**
Sample ID: 500167-0061									**Dissolved Metals by EPA 200 Series Methods**
Chromium		22		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-04									**Water - Sampled: 04/13/16 10:23**
Sample ID: 500167-0062									**Dissolved Metals by EPA 200 Series Methods**
Chromium		21		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-06									**Water - Sampled: 04/13/16 11:02**
Sample ID: 500167-0063									**Dissolved Metals by EPA 200 Series Methods**
Chromium		0.88	C1, J	1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-07									**Water - Sampled: 04/13/16 14:35**
Sample ID: 500167-0064									**Total Metals by EPA 200 Series Methods**
Chromium		6.6		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-09									**Water - Sampled: 04/13/16 14:38**
Sample ID: 500167-0065									**Dissolved Metals by EPA 200 Series Methods**
Chromium		6.7		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-10									**Water - Sampled: 04/13/16 14:48**
Sample ID: 500167-0066									**Total Metals by EPA 200 Series Methods**
Chromium		6.6		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-12									**Water - Sampled: 04/13/16 14:52**
Sample ID: 500167-0067									**Dissolved Metals by EPA 200 Series Methods**
Chromium		6.5		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-13									**Water - Sampled: 04/13/16 15:10**
Sample ID: 500167-0068									**Total Metals by EPA 200 Series Methods**
Chromium		7.8		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-15									**Water - Sampled: 04/13/16 15:12**
Sample ID: 500167-0069									**Dissolved Metals by EPA 200 Series Methods**
Chromium		6.4		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-16									**Water - Sampled: 04/13/16 15:20**
Sample ID: 500167-0070									**Total Metals by EPA 200 Series Methods**
Chromium		8.9		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-18									**Water - Sampled: 04/13/16 15:25**
Sample ID: 500167-0071									**Dissolved Metals by EPA 200 Series Methods**
Chromium		11		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-20									**Water - Sampled: 04/13/16 11:30**
Sample ID: 500167-0072									**Dissolved Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-22									**Water - Sampled: 04/13/16 16:58**
Sample ID: 500167-0073									**Dissolved Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-23									**Water - Sampled: 04/13/16 18:12**

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Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16106A
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:39
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1604016-23									**Water - Sampled: 04/13/16 18:12**
Sample ID: 500167-0074									**Total Metals by EPA 200 Series Methods**
Chromium		3.3		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-25									**Water - Sampled: 04/13/16 18:15**
Sample ID: 500167-0074A									**Dissolved Metals by EPA 200 Series Methods**
Chromium		3.3		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-27									**Water - Sampled: 04/14/16 08:40**
Sample ID: 500167-0075									**Dissolved Metals by EPA 200 Series Methods**
Chromium		11		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-29									**Water - Sampled: 04/14/16 08:42**
Sample ID: 500167-0075A									**Dissolved Metals by EPA 200 Series Methods**
Chromium		11		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-31									**Water - Sampled: 04/14/16 09:06**
Sample ID: 500167-0076									**Total Metals by EPA 200 Series Methods**
Chromium		2.1		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-32									**Water - Sampled: 04/14/16 09:26**
Sample ID: 500167-0077									**Total Metals by EPA 200 Series Methods**
Chromium		1.2		1	ug/L	B16D043	04/18/16	04/19/16	200.8
Lab ID: 1604016-34									**Water - Sampled: 04/14/16 09:30**
Sample ID: 500167-0078									**Dissolved Metals by EPA 200 Series Methods**
Chromium		1.0		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-36									**Water - Sampled: 04/14/16 10:47**
Sample ID: 500167-0079									**Dissolved Metals by EPA 200 Series Methods**
Chromium		19		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-38									**Water - Sampled: 04/14/16 10:50**
Sample ID: 500167-0080									**Dissolved Metals by EPA 200 Series Methods**
Chromium		19		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-40									**Water - Sampled: 04/14/16 14:07**
Sample ID: 500167-0081									**Dissolved Metals by EPA 200 Series Methods**
Chromium		38		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-42									**Water - Sampled: 04/14/16 16:30**
Sample ID: 500167-0082									**Dissolved Metals by EPA 200 Series Methods**
Chromium		ND	U	1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved
Lab ID: 1604016-44									**Water - Sampled: 04/14/16 09:08**
Sample ID: 500167-0076A									**Dissolved Metals by EPA 200 Series Methods**
Chromium		2.1		1	ug/L	B16D046	04/18/16	04/19/16	200.8_Dissolved

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Project Manager:	Grace Ma	**California Site Cleanup Section 3**	**SDG:** 16106A
Project Number:	R16S45	**75 Hawthorne Street**	**Reported:** 05/05/16 16:39
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**	

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B16D043 - 200 Series Digest - Metals, ICP/MS, Total									**Prepared: 04/18/16 Analyzed: 04/19/16**	
									Total Metals by EPA 200 Series Methods - Quality Control	
Blank (B16D043-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D043-BS1)										
Chromium	40.8		1	ug/L	40.0		102	85-115		200
Matrix Spike (B16D043-MS1)		**Source: 1604016-10**								
Chromium	48.3		1	ug/L	40.0	6.6	104	70-130		20
Matrix Spike Dup (B16D043-MSD1)		**Source: 1604016-10**								
Chromium	49.2		1	ug/L	40.0	6.6	106	70-130	2	20
Batch B16D046 - 200 Series Digest (Dissolved) - Metals, ICP/MS, Dissolved									**Prepared: 04/18/16 Analyzed: 04/19/16**	
									Dissolved Metals by EPA 200 Series Methods - Quality Control	
Blank (B16D046-BLK1)										
Chromium	ND	U	1	ug/L						
LCS (B16D046-BS1)										
Chromium	40.1		1	ug/L	40.0		100	85-115		200
Matrix Spike (B16D046-MS1)		**Source: 1604016-29**								
Chromium	52.4		1	ug/L	40.0	10.9	104	70-130		20
Matrix Spike Dup (B16D046-MSD1)		**Source: 1604016-29**								
Chromium	51.5		1	ug/L	40.0	10.9	102	70-130	2	20

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Project Manager:	Grace Ma	**California Site Cleanup Section 3**		**SDG:**	16106A
Project Number:	R16S45	**75 Hawthorne Street**		**Reported:**	05/05/16 16:39
Project:	Selma Pressure Treatment April 2016 Sampling	**San Francisco CA, 94105**			

Qualifiers and Comments

J	The reported result for this analyte should be considered an estimated value.
C1	The reported concentration for this analyte is below the quantitation limit.
U	Not Detected
NR	Not Reported
RE1, RE2, etc:	Result is from a sample re-analysis.