FOURTH FIVE-YEAR REVIEW REPORT FOR PACIFIC COAST PIPELINE SUPERFUND SITE VENTURA COUNTY, CALIFORNIA

U.S. Environmental Protection Agency

Region 9

Approved by: _____

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U.S. EPA, Region 9

Date: August 22, 2016

Executive Summary

This is the fourth five-year review of the Pacific Coast Pipeline Superfund Site (the Site) located just outside the City of Fillmore in Ventura County, California. The purpose of this five-year review (FYR) is to review information to determine if the remedy is, and will continue to be, protective of human health and the environment.

The fifty-five acre Site is a former petroleum refinery that operated from circa 1915 until 1950, when it was converted to a crude oil pumping station that operated until 2002. Groundwater contamination was first discovered at the Site in 1983. In 1986, 38,000 tons of waste material and contaminated soils were removed from the main waste pit and other small disposal areas. Contaminants found during the initial groundwater investigation included benzene, toluene, ethylbenzene, and 1,2-dichloroethane, methylene chloride and toluene. The U.S. Environmental Protection Agency (EPA) added the Site to the National Priorities List in 1989.

On March 31, 1992, EPA signed the Record of Decision (ROD) for the Pacific Coast Pipeline (PCPL) Site. The ROD addressed groundwater contamination and the remedy included groundwater extraction and treatment and soil vapor extraction (SVE). The systems began operating in 1993 and were successful in reducing groundwater contaminant concentrations; however, the systems were shut off in 2002 because they had reached their limits of effectiveness. Groundwater contaminant concentrations had dropped but benzene and toluene remained above California drinking water standards.

EPA issued a ROD Amendment in 2011 addressing soil contamination and two plumes of contaminated groundwater. The soil remedy is excavation of contaminated soil, disposal in an on-site consolidation area, and a cap. The groundwater remedy is air sparging and SVE, followed by enhanced bioremediation with sulfate, followed by monitored natural attenuation (MNA). In addition, institutional controls (ICs) are required to 1) restrict future property use to commercial and/or recreational purposes, 2) limit actions that could interfere with the remedy (i.e., the cap), and prevent groundwater use until the groundwater cleanup levels are achieved.

The remedy at the PCPL Site is functioning as intended. The exposure assumptions, toxicity data, risk assessment methods, cleanup levels, and remedial action objectives are still valid. No other information has come to light that could call into question the protectiveness of the remedy.

The remedy at the Site is currently protective of human health and the environment. There is currently no exposure to the contaminated groundwater as no one is drinking or using groundwater from the plume areas. Soil remediation is complete and there is no exposure to contaminated soil. For long-term protectiveness, two land use covenants, one for soil and one for groundwater, were filed with the Ventura County Recorder's Office.

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List of Abbreviations

AOC	Area of Concern
AS	air sparging
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHHSL	California human health screening level
COC	contaminant of concern
CD	consent decree
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
FYR	five-year review
GWTS	groundwater treatment system
IC	institutional controls
LNAPL	light non-aqueous phase liquid
LUC	land use covenant
MNA	monitored natural attenuation
O&M	operation and maintenance
PAH	polycyclic aromatic hydrocarbon
PCPL	Pacific Coast Pipeline
RAO	remedial action objective
ROD	Record of Decision
SVE	soil vapor extraction
UCL	upper confidence limit
VOC	volatile organic compound

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 will continue to be 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 and, if any, document recommendations to address them.

EPA prepared this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, 40 Code of Federal Regulation Section 300.430(f)(4)(ii) of the National Contingency Plan and EPA policy.

This is the fourth FYR for the PCPL Site. The triggering action for this statutory review is the completion date of the previous FYR, September 20, 2011. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that would allow for unlimited use and unrestricted exposure.

The Site consists of one Operable Unit, which has both soil and groundwater components. A list of the documents reviewed for the FYR is located in Appendix A.

The PCPL FYR team was led by EPA Project Manager Holly Hadlock and included the following participants:

- Mike Massey – EPA Site Attorney
- Cynthia Wetmore – EPA Five Year Review Coordinator
- Jackie Lane – EPA Community Involvement Coordinator
- Cathy Martin – U.S. Army Corps of Engineers Technical Lead

The review began on October 4, 2015. Table 1-1, Five-Year Review Summary Form, provides a brief status of the Site cleanup.

Table 1-1. Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Pacific Coast Pipeline		
EPA ID: CAD980636781		
Region: 9	**State:** CA	**City/County:** Fillmore/Ventura
SITE STATUS		
NPL Status: Final		
Multiple Operable Units? No	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**		
Author name (Federal or State Project Manager): Holly Hadlock		
Author affiliation: EPA		
Review period: 10/4/2015 - 5/30/2016		
Date of site inspection: 2/8/2016		
Type of review: Statutory		
Review number: 4		
Triggering action date: 9/20/2011		
Due date *(five years after triggering action date)*: 9/20/2016		

1.1. Background

The PCPL Site consists of approximately 55 acres located just east of the City of Fillmore in Ventura County, California (Figure 1-1). The Site is a former petroleum refinery owned and operated by Texaco (now a subsidiary of Chevron) from the early 1900s to the early 1950s, when the refinery was shut down and dismantled. Texaco continued to operate a crude oil pumping station until 2002, at which time all on-site oil operations ceased. These past Site operations and associated infrastructure are the source of contamination. All of the infrastructure associated with Texaco operations has been removed except for a deep well that supplies water for construction activities, a water storage tank, and electrical utilities.

1.2. Physical Characteristics

The vacant property is bounded on the west by the concrete channel of Pole Creek, on the south by the railroad tracks, and on the north and east by a steep hillside (Figure 1-2). Environmental remediation facilities include numerous groundwater monitoring wells, storage units, a small field office trailer, and the groundwater treatment system. Perimeter fencing restricts access to the property.

Neighboring land uses are open space, rural residential, and agricultural to the north and east, low density residential and an elementary school to the west, and industrial/commercial to the south and southwest. Light industrial/commercial and recreational uses are the reasonably anticipated future uses for the property based on input from the City of Fillmore and other stakeholders.

The section of Pole Creek that is adjacent to the property is maintained primarily for flood control and is not considered to be aquatic habitat for use by ecological receptors. With the exception of the hillside on the east edge of the property, the PCPL property remains sparsely vegetated and has limited habitat for terrestrial or avian receptors (URS, 2011). The only area on the PCPL property where ecological habitat may exist is the hillside. The hillside area is known as Area of Concern (AOC) 1.

Land use covenants restricting soil and groundwater use on the former refinery property have been filed at the Ventura County Recorder's Office. The City of Fillmore has restrictions on the use of groundwater within the city limits.

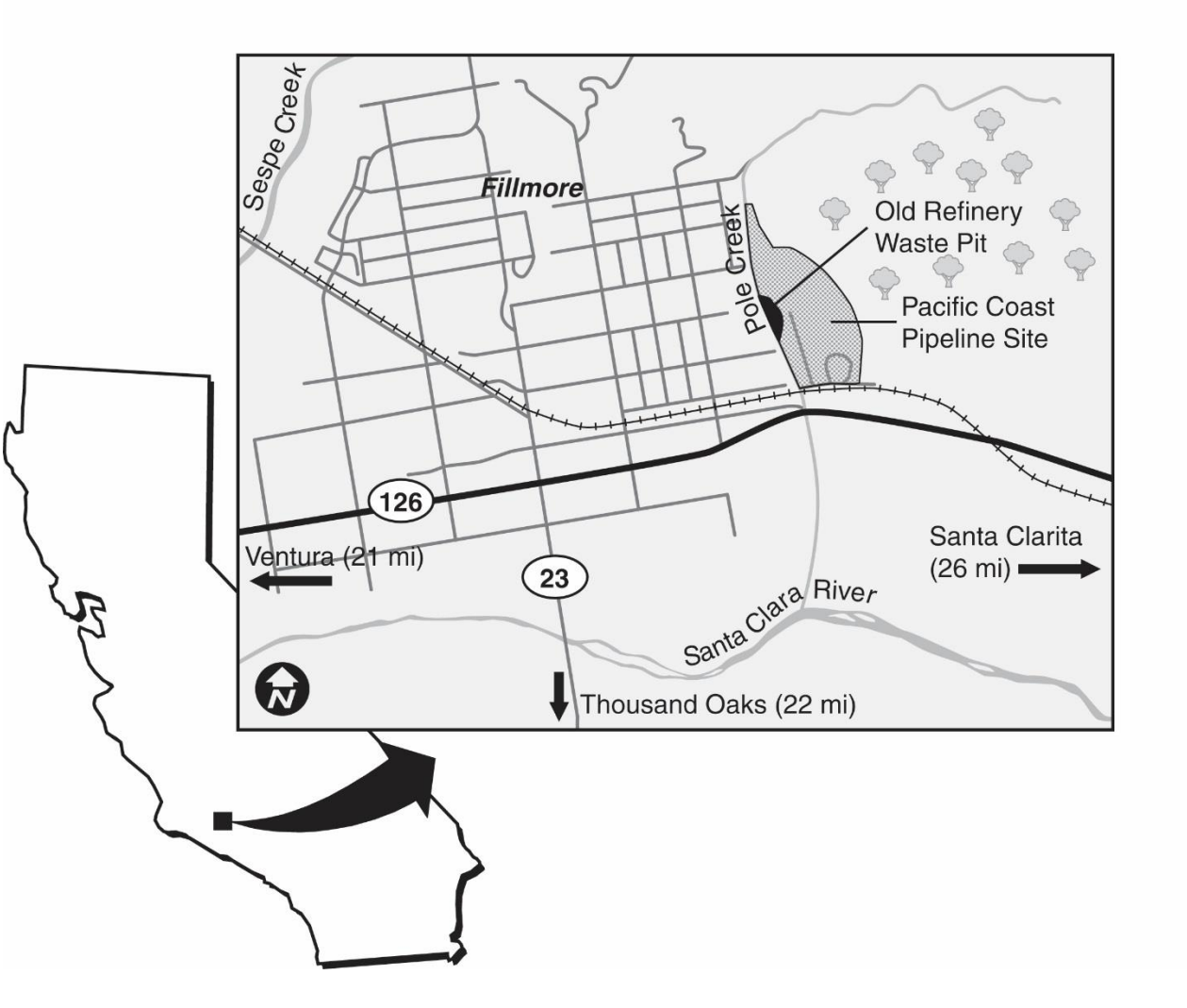

Figure 1-1. Location Map for the Pacific Coast Pipeline Superfund Site

Figure 1-2. Detailed Map of the Pacific Coast Superfund Site

1.3. Hydrology

The Site is located within the eastern portion of the Fillmore Groundwater Basin. The alluvial deposits and the underlying San Pedro Formation are the major water bearing units, with groundwater flow direction toward the west and the confluence of Sespe Creek and the Santa Clara River (Figure 1-3). The extreme variability of the local subsurface geology (discontinuous layers of material with highly variable hydraulic properties) creates a complex hydrogeologic environment. There are two main water bearing zones: Aquifer I, an unconfined to semi-confined shallow aquifer, and Aquifer II, a partially confined to confined aquifer below Aquifer I. Aquifer I, which goes to a depth of 100 feet below ground surface (bgs), is the only one with contaminants. The sand grains gradually get finer at depth, with the grains in Aquifer II finer than those in Aquifer I. Due to discontinuous layering, the two water bearing zones are locally interconnected and semi-confined. However, long-term groundwater elevation monitoring shows that Aquifer I appears to function as a confined system in some locations. Contamination is found only in Aquifer I.

Groundwater levels have fluctuated significantly over the past decades. Currently the depth to Aquifer I in the southern portion of the Site is 67 feet bgs and the depth in the northern portion of the Site is 109 feet bgs. This difference is due to the sloping topography. The southern area groundwater flow rate averages 219 feet per year; the northern area groundwater flow rate averages 142 feet per year. The difference is due to the steeper gradient in the south.

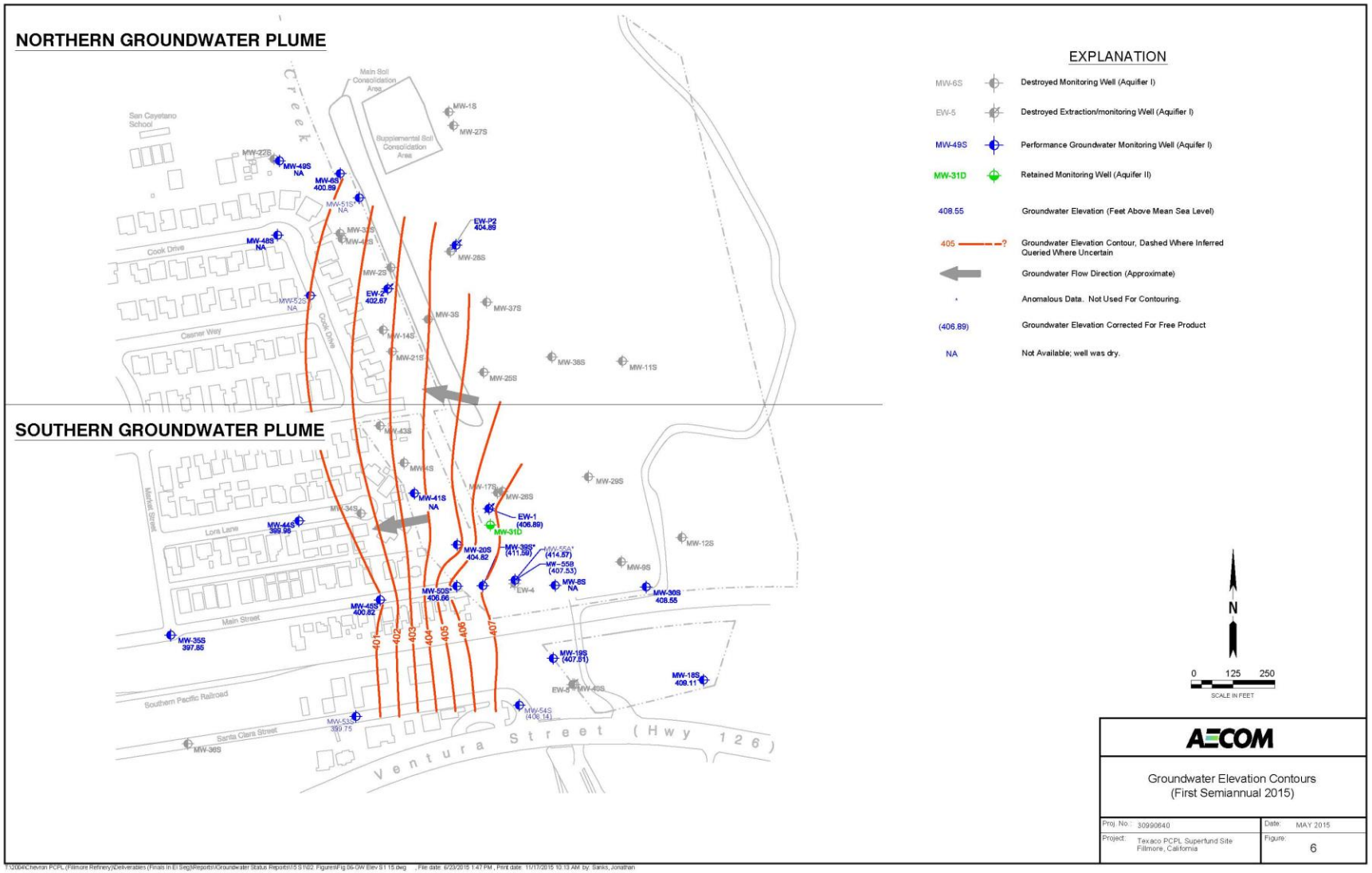

Figure 1-3. Groundwater Contour Map of the Pacific Coast Superfund Site

2. Remedial Actions Summary

2.1. Basis for Taking Action

In 1980, the Regional Water Quality Control Board (RWQCB), Los Angeles Region, directed Texaco to investigate the groundwater at the Site. Texaco conducted several investigations, with oversight by both the California Department of Health Services and EPA. Sampling results revealed that the groundwater was contaminated with a suite of hazardous petroleum chemicals: benzene, toluene and ethylbenzene and xylene. The presence of these contaminants in groundwater was the basis for taking action.

2.2. Remedy Selection

2.2.1. Remedial Action Objectives

On March 31, 1992, EPA signed the ROD for the PCPL Site (EPA, 1992). The objectives of the ROD remedial actions were to reduce groundwater contaminant concentrations to below drinking water standards and to reduce the migration of contamination within the vadose zone.

The 1992 ROD remedy was groundwater extraction and treatment and SVE. This ROD did not address soil contamination. The original remedy was successful in reducing groundwater contaminant concentrations by 90%. However, two plumes of volatile organic compounds (VOCs), referred to as the northern and southern plumes, remained with contaminants of concern (COCs) above the ROD cleanup levels. A 2011 focused remedial investigation and feasibility study indicated that site soil also had COCs that exceeded the levels considered safe for on-site workers, recreational users, and ecological receptors. As a result, the 1992 ROD was amended on September 29, 2011 (EPA, 2011b). The ROD Amendment contains the final remedy for addressing the remaining groundwater contamination and the shallow soil contamination at the Site and limits the future property use to commercial and recreational activities. The remedial action objectives established in the ROD Amendment are:

1) Prevent human exposure through direct dermal contact, ingestion, and inhalation of shallow soil and soil vapor contaminated above threshold levels for commercial land use, construction activities, and recreational activities;
2) Prevent use of contaminated groundwater and restore the aquifer to the most beneficial use, i.e., drinking water, within a reasonable time frame;
3) Prevent contaminants in the former main waste pit (lead, PAHs) from migrating into underlying groundwater; and

4) Reduce contamination in soil below toxicity threshold levels so it is not toxic to the plants and animals of the existing scrub habitat.

2.2.2. Remedy Components

The 1992 ROD remedy components were a groundwater extraction and treatment system and an SVE system. The two systems operated until 2002, at which time they were shut off because they had reached the limits of their effectiveness. The 2011 ROD Amendment remedy components for groundwater and soil are:

1) Northern Plume – MNA;
2) Southern Plume – air sparging in groundwater, followed by enhanced bioremediation, followed by MNA;
3) Excavation of contaminated soil to below 10 feet (final grade) since there are no exposure pathways for contaminants below 10 feet below grade, (no on-site workers, recreational users, residents, or ecological receptors would be exposed to contaminants below 10 feet);
4) Consolidation of the soil in the area of the on-site former Main Waste Pit;
5) Construction of an engineered cap over the consolidation area;
6) Backfill of excavated areas with clean soil;
7) Institutional controls; and
8) A long-term monitoring and maintenance program to ensure the integrity of the cap.

Table 2-1 lists the ROD Amendment cleanup levels for all contaminants of concern.

Table 2-1. Cleanup Levels

Chemical of Concern	Cleanup Level	Basis for Cleanup Level[a]	Risk at Cleanup Level
HUMAN RECEPTORS			
GROUNDWATER	**µg/L**		
Benzene	1	California MCL	cancer, 2.4×10^{-6}
Toluene	150	California MCL	non-cancer, Hazard Index < 1
SOIL	**mg/kg**		
Metals			
Lead[b]	320	Risk Assessment	Blood-lead = 1 µg/dL
Polycyclic Aromatic Hydrocarbons			
Benzo(a)anthracene	1.2	Risk Assessment	Cancer, 1×10^{-6} (commercial/industrial)
Benzo(a)pyrene	0.12	Risk Assessment	
Benzo(b)fluoranthene	1.2	Risk Assessment	
Benzo(k)fluoranthene	1.2	Risk Assessment	

Chemical of Concern	Cleanup Level	Basis for Cleanup Level[a]	Risk at Cleanup Level
Chrysene	12	Risk Assessment	
Dibenz(a,h)anthracene	0.35	Risk Assessment	
Indeno(1,2,3-cd)pyrene	1.2	Risk Assessment	
Naphthalene	13	Risk Assessment	
SOIL GAS	**µg/L**		
Benzene	0.62	Risk Assessment	Cancer, 1 x 10^{-6} (commercial/industrial)
Ethylbenzene	7.8	Risk Assessment	
Naphthalene	0.65	Risk Assessment	
ECOLOGICAL RECEPTORS - SOIL	**mg/kg**		
Lead in surface soil, top 6 inches	26	SLERA	acceptable
Lead in subsurface soil, down to 6 feet	56	SLERA	acceptable

a. MCL – Maximum Contaminant Level (http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.shtml)
CHHSL – California Human Health Screening Levels (http://oehha.ca.gov/risk/chhsltable.html)
SLERA – Screening level ecological risk assessment (Chevron, 2011)

The cleanup levels for groundwater are based on California drinking water standards, also referred to as maximum contaminant levels (MCLs). For PAHs in soil the cleanup level is based on a $1x10^{-6}$ excess lifetime cancer risk. For lead in soil, the cleanup level is 320 mg/kg based on an increase in blood-lead concentration of no more than 1 µg/dL. However, AOC 1 at the eastern edge of the former refinery property has lower lead cleanup levels in order to be protective of ecological receptors. AOC 1 surface soil (top 6 inches) has a cleanup level of 25 mg/kg, which is protective for birds and shrubs, and the deeper soil (from 6 inches to 6 feet) has a cleanup level of 56 mg/kg, which is protective for burrowing mammals.

2.3. Remedy Implementation

2.3.1 Groundwater

1992 ROD

The treatment systems installed pursuant to the 1992 ROD began operating in December 1993. The Site achieved construction completion status when the Preliminary Close Out Report was signed on September 27, 1996. The treatment systems reached the limits of their effectiveness in 2002 and were shut off. The only chemicals remaining in groundwater above their MCLs in 2002 were benzene in the northern plume and benzene and toluene in the southern plume.

2011 ROD Amendment

When the ROD was amended in 2011, benzene was the only contaminant of concern above the MCL in the northern plume. The southern plume had benzene above the MCL in five monitoring wells and toluene above the MCL in one monitoring well. Since then, the persistent drought has caused groundwater levels and contaminant concentrations to drop in both plumes. The drop in

groundwater levels has increased the depth of the unsaturated zone, enabling treatment of residual benzene with SVE. If adequate precipitation causes groundwater levels to rise, EPA anticipates that benzene concentrations will rise above the MCL, which the ROD Amendment remedy will address. Groundwater is discussed in more detail in Appendix B, Data Review.

Northern Plume - MNA

Benzene was the only contaminant of concern consistently above the MCL in the northern plume. The benzene is not migrating and natural attenuation is both containing the plume and lowering the benzene concentration. Toluene, which had been consistently below the MCL of 150 µg/L, rose to just above the MCL in one monitoring well for 2 quarters. It has been below the MCL since February 2012. Pursuant to the 2011 ROD Amendment, MNA activities in 2013 for the northern plume included installation of two new monitoring wells and removal of monitoring wells that were redundant or needed to be removed due to Pole Creek channel upgrades. The northern plume monitoring network currently has 7 monitoring wells (Figure B-1a, page 30). For more information, see Appendix B, Data Review, page 28.

Southern Plume – Air Sparging and SVE

The Phase 1 (east of Pole Creek) groundwater remediation system of air sparging (AS) and SVE began operating in June 2015. It was designed to strip benzene from the LNAPL (light non-aqueous phase liquid) smear zone, reducing the source to a point where remaining benzene in groundwater is primarily present in the dissolved phase. The Phase 2 (west of Pole Creek) system began operating in October 2015. The system consists of 12 AS wells, 6 SVE wells, 10 piezometers/vapor monitoring probes (2 east of Pole Creek and 8 west of Pole Creek) and a treatment unit. Two piezometers and a groundwater monitoring well on the east side of Pole creek were converted to vapor extraction in order to remove benzene in the now unsaturated areas. For Phase 2, five piezometers west of Pole Creek were converted to vapor extraction. The remediation system in the southern plume will operate until benzene reaches the performance goal of 100 micrograms per liter (µg/L). At that point, the remedy will transition to MNA.

The southern plume groundwater monitoring network has 16 groundwater wells, two of which were installed to address data gaps. These wells are monitored semi-annually. For more information, see Appendix B, Data Review, page 28f

2.3.2 Soil and Soil Gas

Soil with lead and PAHs above the ROD cleanup levels was excavated from numerous locations across the Site to a depth of 10 feet below finished grade and placed in two on-site consolidation areas. Contaminated soil below 10 feet was left in place because there is no exposure pathway

and no risk to human health and the environment. This remediation met the ROD cleanup requirements.

Three volatile organic compounds (VOCs), benzene, ethylbenzene, and naphthalene, had been identified during the remedial investigation as present in soil gas at levels above cancer-based health levels in one AOC. All of these VOCs were co-located with PAHs. Excavation of the PAH-contaminated soil also removed these VOCs. Confirmation samples showed that VOC levels at all locations are below the ROD cleanup levels.

The majority of the excavation work was completed in 2013. However, due to time constraints and the requirement of the Regional Water Quality Control Board (RWQCB) that site work cease by November 2013, one excavation point could not be excavated before the site was secured for the winter. Excavation work resumed in March 2014 and was completed in November 2014. Soil confirmation results can be found in the *Soils Remedial Action Report Part 2* (URS, 2015).

Due to the quantity of excavated soil, a supplemental consolidation area was dug adjacent to the main consolidation area. After placing all contaminated soil into the two consolidation areas, the excavated areas were backfilled with clean soil, which was compacted. An engineered cap was placed on each consolidation area and drainage ditches and detention ponds were constructed to capture storm water runoff.

Following backfill and grading activities, temporary vapor monitoring probes were installed to a depth of approximately 5 feet bgs. The probes were installed where PAHs remain below a depth of minimum of ten feet of fill, as allowed in the remedy. These probes were sampled during the post-remediation vapor sampling events. Post-remediation vapor sampling confirmed that ROD cleanup requirements were met.

2.3.3 Institutional Controls

The 2011 ROD Amendment includes institutional controls (ICs) for both groundwater and soil. ICs are non-engineered controls applied to property to 1) minimize the potential for exposure to contamination left on a property, 2) minimize the potential for exposure during a long-term treatment before cleanup levels are reached, and 3) protect the remedy after it is completed.

The soil remedy includes ICs to restrict future property use to commercial and recreational purposes and to limit actions that could interfere with the two caps. Pursuant to the 2013 First Amended Consent Decree (CD), Chevron submitted an Access and Institutional Controls Work Plan. This plan describes IC program components and activities for implementing access and IC requirements. EPA, the California Department of Toxic Substances Control (DTSC), and Chevron developed a soil land use covenant (LUC) to restrict the use of the former refinery

property. The soil LUC is between Texaco Downstream Properties Inc., an indirect subsidiary of Chevron, and DTSC, with EPA as a third-party beneficiary, and sets forth the restrictions that apply to the former refinery property. It was recorded at the Ventura County Recorder's Office on August 19, 2016, and "runs with the land", meaning the restrictions are binding on current and subsequent property owners and remain in effect until they are formally removed or modified.

Because the groundwater plumes are on property owned by Chevron just outside the City of Fillmore and on private property within the city limits, the groundwater remedy relies on two ICs: a groundwater LUC for Chevron-owned property and continued enforcement of the City of Fillmore restriction on drilling wells in city limits in areas of contaminated groundwater until the cleanup levels are reached. The groundwater LUC restricts groundwater use on the former refinery property until MCLs are reached. The LUC was recorded at the Ventura County Recorder's office on August 19, 2016. ICs are listed in Table 2-2.

Table 2-2. Summary of ICs

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; Date
Groundwater	Yes	Yes	Sitewide	Restrict installation of groundwater wells; Prevent exposure to contaminated groundwater	Restrictive covenant; 8/19/2016
Soil	Yes	Yes	Sitewide	Prevent exposure to contaminated soils; restrict future property use to residential/commercial and limit action that could interfere with the remedy (i.e., the cap)	Restrictive covenant; 8/19/2016

2.4. Operation and Maintenance (O&M)

Northern Plume

The northern plume final remedy of MNA is being monitored through routine groundwater sampling events. No intermediate performance goals are necessary to track the progress of biological degradation to demonstrate final compliance with applicable MCLs.

Southern Plume

The southern plume groundwater remediation system has successfully operated since June 2015. Due to the drop in groundwater levels, groundwater was not encountered in the remediation area

during the most recent reporting period. As currently operating, the AS system adds oxygen to the vadose zone and strips residual contaminants. The SVE system removes contaminant mass, which is destroyed with a thermal oxidizer. The Phase 1 wells have removed 55,801 pounds of total petroleum hydrocarbons (TPH) and 4.6 pounds of benzene. The Phase 2 wells have removed 93,043 pounds of TPH and 16 pounds of benzene.

The Phase 1 system uptime since the start of operation is 82%. The Phase 2 uptime is 100%. AS system downtime was primarily due to SVE system shutdowns and minor maintenance activities. SVE downtime was due to propane refills and excessive water accumulation in the air/water separator. To address the water accumulation, a water pipeline was added as part of the Phase 2 installation to automate water transfer from the air/water separator to the on-site storage tank. Soil vapor probe readings were measured daily for the first week of operation, weekly for the first three months, and now once a month. No exceedances of CHSSLs were detected in the shallow vapor probes.

The AS/SVE system will operate until it is no longer effective, estimated to be no longer than six years, at which point the next phase of the remedy, enhanced bioremediation, will be implemented. When benzene concentrations reach 100 micrograms per liter (µg/L), the remedy will transition to MNA. Given the accelerated rate of SVE due to the drought, sulfate circulation may not be necessary if benzene concentration are below 100 ug/L after groundwater levels recover.

Soil

The Soil Operation, Maintenance, and Monitoring Plan (OM&M) Plan (URS, 2015) establishes the primary goals for prevention of uncontrolled exposures to impacted soils, and to protect the health and safety of persons on the Site. To accomplish these goals, The OM&M Plan addresses the following objectives:

- Establish an inspection, monitoring, and maintenance program and schedule of activities for the first 5 years following completion of the soil remedial action;
- Identify the roles and responsibilities for OM&M activities and oversight;
- Identify potential maintenance issues and possible repairs;
- Minimize disturbances of impacted soils;
- Provide for record-keeping of inspections and repairs; and
- Reporting to EPA.

The first inspection was conducted on April 5, 2016. The cap was found to be intact and no maintenance or repair issues were noted.

3. Progress Since the Last Five-Year Review

3.1. Previous Five-Year Review Protectiveness Statement and Issues

The protectiveness statement from the Third FYR for the Pacific Coast Pipeline Site stated the following:

> *The remedy at the Pacific Coast Pipeline Superfund Site is currently protective of human health and the environment. There is currently no exposure to the contaminated groundwater as no one is drinking or using groundwater from this area. Access to the property is restricted, so exposure to contaminated soil is limited. For long-term protectiveness and to make the property ready for reuse, the ROD will be amended to implement final soil and groundwater remedies, as evaluated in the 2011 FS and recommended in the 2011 Proposed Plan.*

The Third FYR included four issues and recommendations. Each recommendation and its current status is summarized in Table 3-1.

Table 3-1. Status of Recommendations from the 2011 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description*	Completion Date (if applicable)
Soil – clean up soil for future commercial, recreational uses	Amend ROD for final soil remedy as evaluated in remedial investigation/feasibility study (RI/FS) and recommended in proposed plan (PP).	Completed	ROD Amendment	September 2011
	Complete soil remedy.	Completed	43,612 CY of soil excavated and placed in the Consolidation Areas or transported off-site for disposal. Backfill of the excavations and capping of the CAs completed. RAOs achieved.	November 2014
Groundwater – final remedies to achieve RAOs	Amend ROD for final groundwater remedies as evaluated in RI/FS and recommended in PP.	Completed	ROD amended in 2011 to southern plume air sparging, enhanced bioremediation, and MNA. When benzene concentrations reach 100 µg/L MNA will become the final remedy. Northern plume MNA only.	Cleanup levels are expected to be reached within 25 years in southern plume, 50 years in northern plume.
	Implement air sparging pilot test in southern plume.	Completed	Benzene in the smear zone being reduced with the air sparging / SVE system.	June 2015

Issue	Recommendations	Current Status	Current Implementation Status Description*	Completion Date (if applicable)
Future land and groundwater use	Establish institutional controls for commercial/industrial land use and to restrict groundwater extraction	Completed	Land use covenants signed and recorded with Ventura County	8/19/2016
Optimize Groundwater Monitoring Network	Implement optimized groundwater monitoring. Reduce sampling frequency to semi-annual for the southern plume and annual for the northern plume.	Completed	Some wells added, some removed. All GW wells monitored semi-annually. Some wells dry due to drought.	Implemented in 2013

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

The groundwater remedy was addressed during this FYR period through the following actions:

1) Installation and operation of an AS/SVE system;
2) Establishment of a sentinel well network for the northern and southern plumes;
3) Groundwater monitoring;
4) Statistical analysis of benzene results to determine trends.

The AS/SVE system in the southern plume was installed and commenced operation in June 2015 in accordance with the *Final Remedial Design for Air Sparging in the Southern Plume* (URS, 2014a). The system was designed to strip benzene from the LNAPL smear zone, reducing the source to a point where remaining benzene in groundwater is primarily present in the dissolved phase.

During this reporting period, benzene did not exceed the action criteria in the downgradient sentinel wells. The sentinel well network established for the northern groundwater plume includes monitoring wells MW-48S, MW-49S, and newly installed MW-52S. The sentinel well network established for the southern groundwater plume includes monitoring wells MW-35S, MW-44S, and MW-45S.

Eleven groundwater monitoring events have been conducted since the last FYR. Statistical analyses were performed on the benzene results to determine trends and evaluate current results versus historical. All statistically significant trends were decreasing and no results exceeded statistical evaluation criteria, i.e., upper confidence limit (UCL). Groundwater elevations have declined due to regional drought conditions and have resulted in several wells going dry at the Site. The dissolved-phase concentrations have also declined as less groundwater is in contact with residual petroleum hydrocarbon in soil. Results for the sampling events are summarized in

Groundwater Compliance Monitoring Reports (URS, 2013a; URS, 2014b; AECOM, 2015, AECOM, 2016).

The 2011 ROD Amendment set forth goals for excavation and disposal of contaminated soils. These goals are documented in the *Final Soil Remedial Design* (URS, 2013b) and remediation results are in the *Soil Remedial Action Reports*, Parts 1 and 2 (URS, 2014c, d). A total of 41,899 CY of soil was excavated and placed in the consolidation areas. An additional 1,713 CY was transported for off-site disposal. The excavations were backfilled and the Site was graded to provide a minimum of 10 feet of clean soil above excavations. EPA and DTSC allowed concentrations of lead and PAHs deeper than 10 feet at finished grade to exceed the cleanup levels because there are no exposure pathways for these contaminants at that depth.

The first annual site inspection was conducted by AECOM on April 5, 2016, in accordance with the Soil Operation, Monitoring, and Maintenance Plan (URS, 2015). The cap was found to be intact and no maintenance or repair issues were noted.

4. Five-Year Review Process

4.1. Community Notification, Involvement and Site Interviews

A public notice (Appendix E) was published on March 24, 2016, in The Ventura County Star and on April 28, 2016, in the Fillmore Gazette. No one contacted EPA about the five-year review.

Interviews were conducted to document any issues or concerns with the remedy that has been implemented to date. Local regulatory authorities were contacted by phone. The results of these interviews are summarized below and are included in the Site Inspection Report:

- Peter Jensen (Venture County Fire Department Hazardous Materials Officer) – Mr. Jensen had no issues or recommendations.
- Kevin McSweeney (City of Fillmore Planning Department Community Development Director) – Mr. McSweeney had no sewage or traffic issues; a solar farm is planned for the Site.

Zach Gautsch, Lead Field Engineer for AECOM, Chevron's contractor, was interviewed in person during the February 8th Site inspection. He provided detailed information about the AS/SVE system and led the Site tour.

4.2. Data Review

4.2.1. Groundwater

There are two distinct plumes of groundwater contaminated with VOCs, one beneath the former main waste pit (northern plume) and one in the southwestern part of the Site (southern plume). Groundwater monitoring has continued since the Site was placed on the NPL. EPA assessed groundwater monitoring data from 1992 to 2007 and determined that the groundwater plumes remain stable, contamination is not spreading, and that contaminant concentrations are decreasing. In the southern plume, small pockets of benzene as LNAPL (not dissolved in water and floating at the top of the aquifer) have been detected, resulting in higher concentrations than found in the northern plume. In spite of the LNAPL, concentrations of benzene are decreasing across the Site.

Currently the semi-annual monitoring program includes 23 wells; however, samples were collected from only nine wells during the most recent sampling (November 2015) either because they contained a limited amount of measurable LNAPL (two wells) or because they contained too little water to sample due to drought conditions. Due to this relative lack of data, the benzene distribution in groundwater was estimated using historical groundwater analytical data to account for the declining groundwater levels associated with drought conditions, but is generally consistent with previous sampling events. Groundwater monitoring results are included in Appendix B, Data Review.

Trend analysis and comparison to statistical evaluation criteria (i.e., UCLs) were performed for historical benzene results. As described in the 2015 First Semi-annual Groundwater Compliance Monitoring Report (Chevron, 2015), all statistically significant trends were decreasing and no results exceeded UCLs.

MNA is the only remedial action for the northern plume and is the final component for the southern plume. MNA will not become the final remedy in the southern plume until benzene concentrations reach a target concentration of 100 µg/L. Overall, groundwater concentrations are trending towards the remedial goals established for the Site. A more detailed description of the MNA status for each groundwater plume is summarized in Appendix B.

The historical maximum benzene concentrations are generally located near well EW-P2 (northern plume) and well MW-50S (southern plume). In the most recent sampling event, benzene was not detected in any wells at a concentration above the laboratory reporting limit of 0.5 µg/L; however, two wells were not sampled due to LNAPL. These monitoring results are an anomaly due to the drought in Southern California. Because only eight monitoring network wells were available for sampling, deeper well MW-31D (screened within Aquifer II) was sampled to evaluate whether vertical migration of benzene was occurring. Benzene was not detected in this

deeper well. When (if) Aquifer I is replenished, EPA expects benzene concentrations to temporarily increase and then continue the consistent historical decline.

4.2.2. Soil and Soil Gas

The soil remedial action results are presented in the *Soil Remedial Action Reports, Parts 1 and 2* (URS, 2014c,d). During remediation, approximately 41,899 cubic yards of soil was removed from 96 excavations and placed within the Main and Supplemental Consolidation Areas for capping. An additional 1,713 cubic yards was removed from seven excavations and transported for off-site disposal at a licensed facility. Clean soil was used to backfill remedial excavations, for consolidation area fill, and for general grading. All confirmation samples collected were either below cleanup levels or greater than 10 feet below final grade. These actions plus final grading and drainage completed the soil remediation. See Appendix B for additional detail.

Following backfill and grading activities, temporary vapor monitoring probes were installed to a depth of approximately 5 feet bgs. The probes were installed where PAHs remain below ten feet of fill, as allowed in the remedy. The work was conducted as described in the Work Plan for Post-Remediation Soil Vapor Sampling dated July 9, 2014 (URS, 2014b).

With the exception of one probe location, soil gas results were below ROD cleanup levels. Soil probe VP-OS-18-02 had concentrations of benzene and ethylbenzene detected above the ROD cleanup levels at 620 and 7,800 micrograms per cubic meter ($\mu g/m^3$), respectively. This probe was resampled in January 2015 and soil gas concentrations had significantly attenuated, but still exceeded the ROD cleanup levels. Two additional probes, VP-OS-18-04 and VP-OS-18-07, were installed nearby to delineate the elevated concentrations. Concentrations of VOCs were not detected above ROD cleanup levels in these additional probes, indicating the elevated VOCs were in a very small area.

Vapor probe VP-OS-18-02 was sampled a third time in July 2015. Benzene, ethylbenzene, and naphthalene were not detected above the laboratory reporting limit of 2.5 $\mu g/m^3$, well below the ROD cleanup levels for these chemicals.

4.3. Site Inspection

EPA conducted the FYR Site inspection on February 8, 2016. In attendance were Holly Hadlock (EPA Remedial Project Manager), Leslie Klinchuch (Chevron Project Manager), Zach Gautsch (AECOM Lead Field Engineer), Jon Sanks (AECOM Project Manager), and Peter Stumpf (AECOM Engineer). The purpose of the inspection was to assess the protectiveness of the remedy.

The findings from the site inspection (Appendices F, G) are listed below:

- All on-site documents and records for operation and maintenance, health and safety, permits, compliance, and security were up to date and available.
- Operation and maintenance costs were available from AECOM but not evaluated during the site inspection.
- Access was determined to be in compliance. However, institutional controls for soil and groundwater in the form of land use covenants had not been finalized.
- No vandalism, trespassing, or land use changes (on site or off site) have been reported.
- General site conditions are good.
- Capped area covers do not show any signs of degradation or lack of functionality.
- The groundwater treatment system (in-situ air sparging) is in good condition and monitoring data has been submitted on time with acceptable quality.
- All wells (air sparging, dual use, piezometers, and groundwater monitoring) in use were inspected and found to be in good condition.

Overall observations for the soil remedy are that the goal of removing contaminated soils to levels that allow for commercial and recreational use has been accomplished. There were no recommendations for improvement of the soil remedy, or for operation and maintenance of the capped area.

The final groundwater remedy has been operating adequately for approximately one year. Low groundwater levels have allowed optimization of LNAPL vapor extraction through the treatment system. The remedy is protective as no one is drinking the groundwater. There are no other opportunities for optimization at this time.

5. Technical Assessment

5.1. Question A: Is the remedy functioning as intended by the decision documents?

5.1.1. Northern Plume

Yes. The MNA remedy selected for the northern groundwater plume is functioning as intended. It was implemented in accordance with the requirements of the decision documents and design specifications. It is projected to achieve remedial goals within 50 years.

5.1.2 Southern Plume

Yes. The selected remedy for the southern plume is operating as intended. Benzene concentrations continue on a downward trend. The treatment system has removed 34 pounds of benzene and toluene combined and 148,800 pounds of total petroleum hydrocarbons. The system will operate until it is no longer effective at removing benzene, estimated to occur in 2018, at which time the enhanced bioremediation remedy will be implemented, if necessary. When benzene concentration is less than 100 µg/L the remedy will transition to MNA. The southern plume is stable in size and the final remedy is expected to achieve cleanup levels in 25 years.

In May 2015 monitoring well 53S at the southwest edge of the southern plume had benzene at 14 µg/L, which is above the benzene MCL of 1 µg/L. There is no well immediately downgradient; the downgradient southern plume sentinel monitoring well 35S, is approximately 115 yards to the northwest. Benzene has never been detected in MW-35S. Because the plume is stable and the concentrations are dropping across the Site, EPA expects that the benzene in MW-53S will behave similarly and will not spread further downgradient. Due to the historic drought in the area, MW-53S was dry at the last sampling event in November 2015.

5.1.3 Soils

The soil remedial action was completed in 2014 and RAOs were achieved.

5.1.4 Institutional Controls

Institutional controls will minimize the potential for exposure to soil contamination left on the former refinery property and will minimize the potential for exposure to groundwater before MCLs are reached. Two LUCs and a City of Fillmore ordinance are the controls that are specified the 2011 ROD at the PCPL Site. In accordance with California Code of Regulations Title 22, Section 67391.1 (d), an LUC for soil and an LUC for groundwater have been developed by EPA, DTSC, and Chevron for property owned by Chevron. The soil LUC prohibits disturbance of the consolidation areas where soil is capped and forbids certain uses (residential, schools, hospital) in perpetuity. The groundwater LUC establishes appropriate and enforceable controls on drilling and groundwater use until MCLs have been reached. The LUCs were filed with the Ventura County Recorder's Office on August 19, 2016. The City of Fillmore restricts drilling wells in areas of contaminated groundwater (City of Fillmore Municipal Code, title 8, Chapter 8.12, Section 100). This restriction prevents exposure to contaminated groundwater that has migrated off the former refinery property and is within the city limits. Perimeter fencing, which is not required, prevents access to the cap.

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, toxicity data, risk assessment methods (Appendix D), cleanup levels (Appendix C), and RAOs used at the time of the 2011 ROD Amendment are still valid.

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

No other information has come to light that could call into question the protectiveness of the remedy.

6. Issues/Recommendations

There are no issues and recommendations.

6.1. Other Findings

MW-53S at the southwest edge of the southern plume had benzene at 14 µg/L, which is above the MCL of 1 µg/L. There is no well immediately downgradient. Because the plume is stable and the concentrations are dropping across the Site, EPA expects that the benzene in this location will behave as it has across the entire Site and will not spread further downgradient. However, EPA will continue to monitor this well to ensure that the groundwater remedy remains protective.

7. Protectiveness Statement

Table 7-1. Protectiveness Statement

Protectiveness Statement(s)		
Operable Unit: Sitewide	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:* None
Protectiveness Statement: The remedy at the Pacific Coast Pipeline Superfund Site is currently protective of human health and the environment. There is currently no exposure to the contaminated groundwater as no one is drinking or using groundwater from the plume areas. Soil remediation is complete so there is no exposure to contaminated soil. For long-term protectiveness, two land use covenants, one for soil and one for groundwater, were filed with the Ventura County Recorder's Office.		

8. Next Review

The next five-year review report for the Pacific Coast Pipeline Superfund Site is required five years from the completion date of this review.

Appendix A: List of Documents Reviewed

AECOM. 2015. *Groundwater Compliance Monitoring Report (First Semi-Annual 2015), Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. August 8, 2015.

AECOM. 2015. *Post-Remedial Soil Vapor Sampling Report, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. October 30, 2015.

AECOM. 2016. *Groundwater Compliance Monitoring and Remedial Performance Evaluation Report, Second Semi-Annual 2015, Pacific Coast Pipeline Superfund Site, Fillmore, California.* February 12, 2016, Revised April 4, 2016.

EPA. 1992. *Pacific Coast Pipeline (Texaco Fillmore Refinery) Superfund Site Record of Decision*. March 31, 1992.

EPA. 2011. *EPA Superfund Third Five-Year Review Report, Pacific Coast Pipeline*. September 20, 2011.

EPA. 2011. *EPA Superfund Record of Decision Amendment, Pacific Coast Pipeline.* September 2011.

URS. 2006. *Soil Sampling Phase 1 – Former Tank Areas Pacific Coast Pipeline (PCPL) Superfund Site Fillmore, California*. September 8, 2006

URS, 2007. *Soil Sampling Phase 2 – Historical Operations PCPL Superfund Site Fillmore, California.* April 15, 2008

URS. 2011. *Remedial Investigation/Feasibility Study, Pacific Coast Pipeline Superfund Site, Fillmore, California*. January 14, 2011.

URS. 2012. *Performance Groundwater Monitoring Plan.* December 6, 2012.

URS 2013a. *Quarterly Groundwater Monitoring Report for Fourth Quarter 2012, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. February 15, 2013.

URS. 2013b. *Final Soil Remedial Design, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. April 29, 2013.

URS. 2013. *Groundwater Well Installation and Destruction Report, Pacific Coast Pipeline (PCLP) Superfund Site, Fillmore, California*. July 15, 2013.

URS. 2014c. *Soil Remedial Action Report (Part 1), Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. April 17, 2014.

URS. 2014b. *Groundwater Compliance Monitoring Report (First Semi-Annual 2014), Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. August 27, 2014.

URS. 2014a. *Final Remedial Design for Air Sparging in the Southern Plume.* September 4, 2014.

URS. 2015b. *Final Soil Operation, Maintenance Plan, and Monitoring Plan, Pacific Coast Pipeline (PCPL) Superfund Site.* May 7, 2015.

URS. 2015a. *Soil Remedial Action Report (Part 2), Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*. January 26, 2015. Revised August 28, 2015.g3

Appendix B: Data Review

1. Groundwater

There are two distinct plumes of groundwater contaminated with benzene and toluene: one beneath the former Main Waste Pit (northern plume) and one in the southwest part of the Site (southern plume)(Figure B-1b). Groundwater monitoring indicates that the footprints of the groundwater plumes remain stable, contamination is not spreading, and concentrations are dropping. Twenty-two wells are monitored semi-annually. However, only 10 wells were actually sampled in May 2015 and 9 in November; other wells contained too little water due to drought conditions and two contained LNAPL, which would have resulted in non-representative samples. Results of groundwater monitoring are included in the *Groundwater Compliance Monitoring* Reports (URS, 2013a; URS, 2014b; AECOM, 2015, AECOM, 2016).

Table B-1 shows the decline in contaminant concentrations over the four FYR periods.

Table B-1. Maximum Groundwater Contaminant Concentrations (µg/L)

VOC	ROD Cleanup Level	1st Five-Year Review	2nd Five-Year Review	3rd Five-Year Review	4th Five-Year Review
Benzene	1	650	430	380	120
Toluene	100	180	150	190	6.5
µg/L = micrograms per liter					

The groundwater analytical data were evaluated using established triggering action criteria. The triggering criteria include action limits to indicate whether benzene is migrating downgradient of the Site. The benzene concentrations did not exceed action limit criteria during this reporting period. The action criteria are summarized as follows:

- **Northern Groundwater Plume:** A benzene concentration exceeding 20 µg/L in groundwater monitoring wells MW-48S / MW-49S/ MW-52; or
- **Southern Groundwater Plume:** A benzene concentration exceeding 150 µg/L in groundwater monitoring well MW-45S or 1 µg/L in groundwater monitoring wells MW-35S / MW-44S.

During the most recent sampling event in November 2015, out of 22 wells:

- 11 were dry,
- 2 had small quantities of LNAPL so were not sampled, and
- 9 contained sufficient water to sample, two in the northern plume and seven in the southern plume.

Benzene was not detected in analytical sampling results above the reporting limit of 0.50 µg/L in any of the wells. Due to this relative lack of data, the benzene distribution in groundwater was estimated using historical groundwater concentrations to account for the declining groundwater levels associated with drought conditions, but is generally consistent with previous sampling events. The historical maximum benzene concentrations are generally located near well EW-P2 (northern plume) and well MW-50S (southern plume). Because few wells were available for sampling, deeper well MW-31D (screened within Aquifer II) was sampled to evaluate whether vertical migration of benzene was occurring. Benzene was not detected at a concentration above the laboratory reporting limit of 0.5 µg/L in well MW-31D. The 2015 first semi-annual benzene results are consistent with declining historical results at the Site. The 2015 second semi-annual monitoring results are a drought-related anomaly because no benzene was detected above MCLs. The benzene distribution in March 2011 and May 2015 is shown in Figures B-1a and b.

According to the 2011 ROD Amendment, restoration of groundwater to California MCLs is expected within 50 years for the northern plume and 25 years for the southern plume.

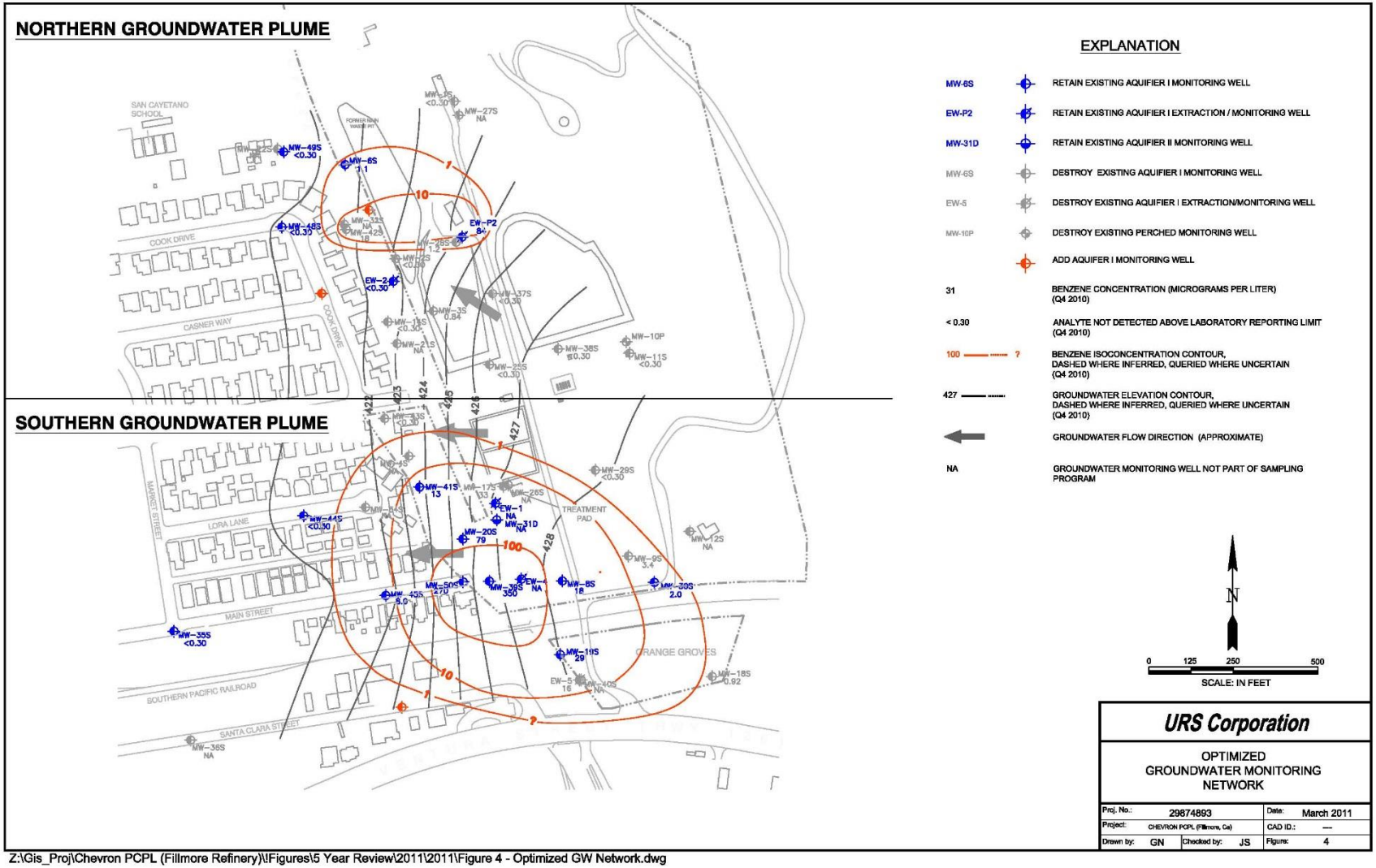

Figure B-1a. 2011 Benzene Distribution

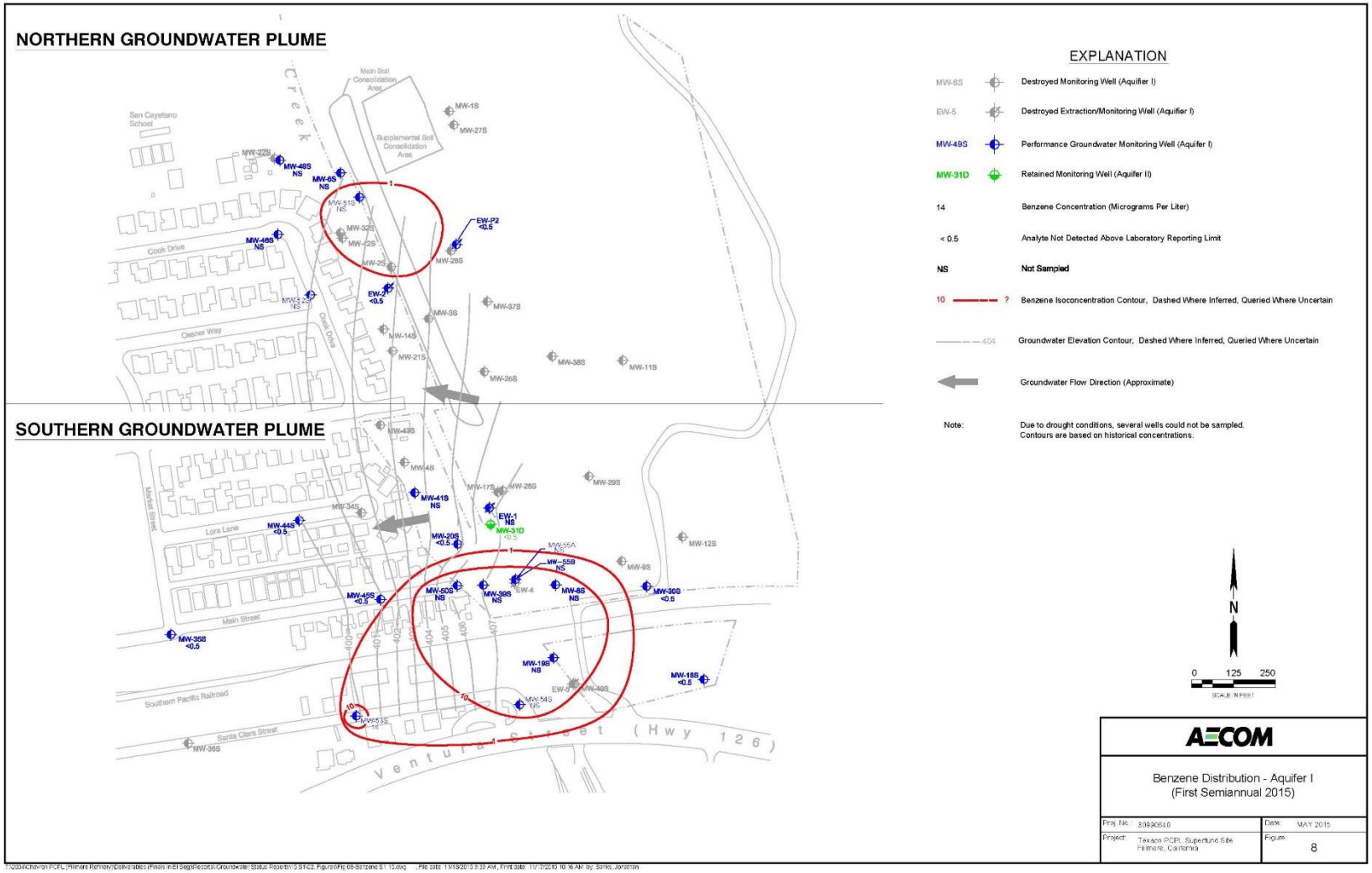

Figure B-1b. 2015 Benzene Distributione

Trend analyses and comparisons to statistical evaluation criteria, i.e., upper confidence limits (UCLs), were performed for the 2015 benzene results (Figure B-2). As described in the 2015 First Semi-annual Groundwater Compliance Monitoring Report (Chevron, 2015), all statistically significant trends were decreasing and no results exceeded UCLs.

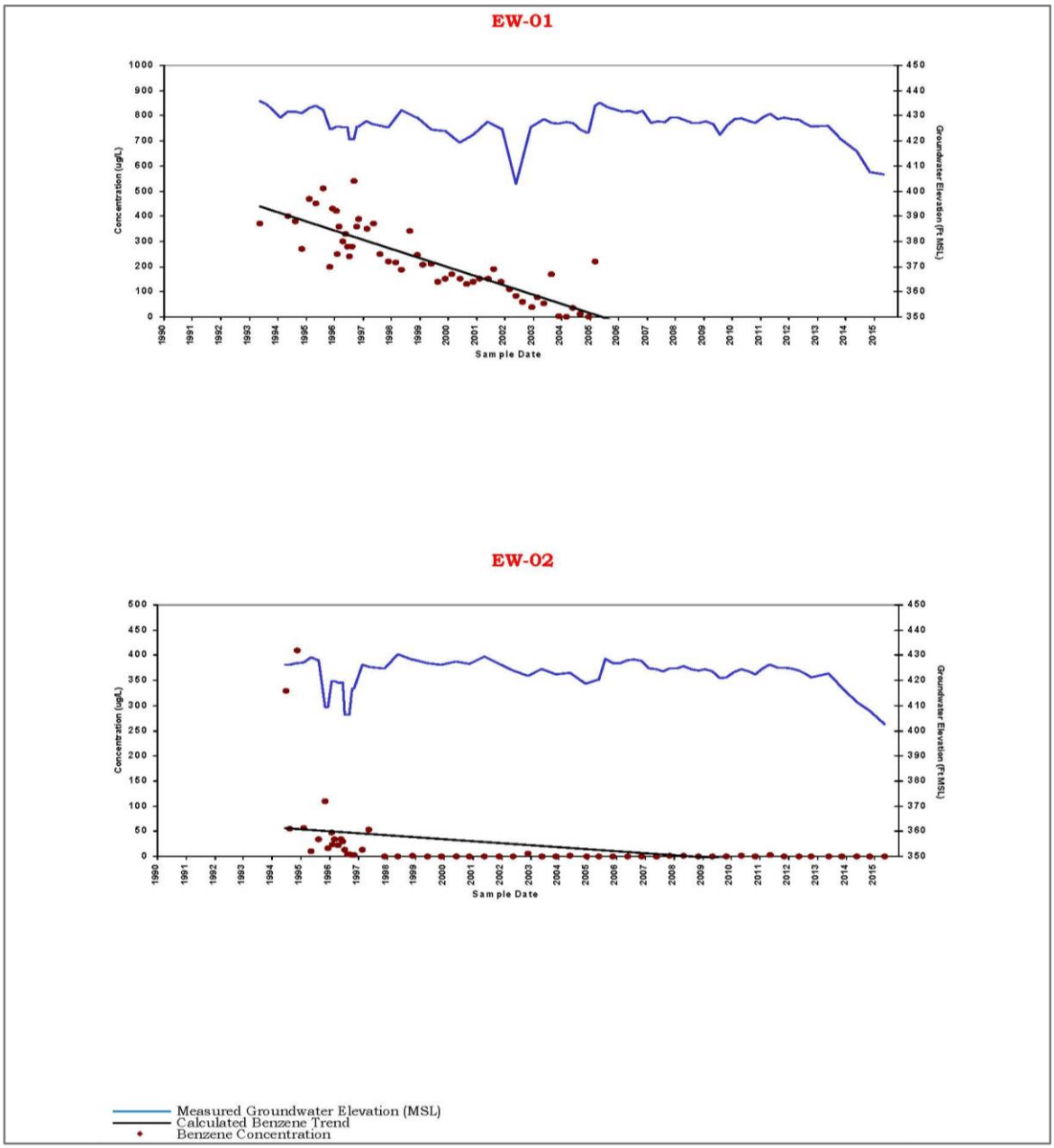

Figure B-2 – Groundwater Benzene Trends

2. Soil

The soil remedial action results are presented in the *Soil Remedial Action Reports, Part 1 and Part 2* ((URS, 2014 c; URS, 2015). A total of 41,899 cubic yards of soil were removed from 96 excavations and placed within the Main and Supplemental Consolidation Areas, which were capped. An additional 1,713 cubic yards were removed from seven excavations and transported for off-site disposal at a licensed facility. Site soil identified for use as backfill material was sampled at a rate of one sample per 1,000 cubic yards to ensure that it did not contain contaminants at levels that exceeded cleanup levels. Clean soil was used to backfill remedial excavations and for general grading. Final grading and drainage controls completed the soils remediation.

Risk-based soil cleanup levels calculated for PAHs and lead were presented in the 2011 ROD Amendment. Cleanup levels were consistent across the Site, with the exception of the hillside along the eastern property boundary, designated as AOC 1 in the RI/FS (URS, 2011a). The hillside had lower lead cleanup levels to protect ecological receptors, i.e., birds and burrowing mammals. The risk-based cleanup levels are summarized in Table B-2.

Table B-2 – Soil Cleanup Levels

Chemical of Concern	Cleanup Level (mg/kg*)
Polycyclic Aromatic Hydrocarbons	
Benzo(a)anthracene	1.2
Benzo(a)pyrene	0.12
Benzo(b)fluoranthene	1.2
Benzo(k)fluoranthene	1.2
Chrysene	12
Dibenz(a,h)anthracene	0.35
Indeno(1,2,3-cd)pyrene	1.2
Naphthalene	13
Metals	
Lead	320
Lead within Hillside Area – AOC1 (0 to 6 inches)	26
Lead within Hillside Area – AOC1 (6 inches to 6 feet)	56

A total of 4,527 confirmation samples were collected; selected results are presented in this data review. This basis for selection was as follows:

- Samples with the deepest final excavation depth;
- Samples with the highest post-excavation results for lead and PAHs;
- Samples collected where there were deviations from the *Final Soil Remedial Design* (URS, 2013b)

The deepest excavation was 28 feet below ground surface (bgs) at excavation point 87. Confirmation samples collected here contained concentrations of naphthalene (46 mg/kg) above the cleanup standard. These areas were covered with at least 10 feet of clean fill. Since clean fill covers the remaining contamination, there is no exposure. Therefore, the contamination left in place does not affect protectiveness.

Samples with the highest lead levels (excavation points 72 and 102, and confirmation sample FSF-14-0107) were from Lot CH-2. Lead concentrations above the cleanup standard of 320 mg/kg ranged from 1,900 to 3,400 mg/kg. The lead-contaminated soil left in place within excavations does not affect protectiveness because it was covered with a minimum of 10 feet of clean fill, thereby preventing exposure.

The highest PAH confirmation sample levels were collected from excavation point 20. Concentrations were above the cleanup levels of 0.12 mg/kg for benzo(a)pyrene, and 13 mg/kg for naphthalene at 0.46 mg/kg and 20 mg/kg, respectively. The PAH-contaminated soil left in place within excavations does not affect protectiveness because a minimum of 10 feet of clean fill was placed over it.

3. Soil Vapor Extraction

Soil vapor extraction (SVE) was implemented pursuant to the 1992 ROD. The 2011 ROD Amendment reintroduced SVE as a contingency remedial action for the southern plume. SVE was to be implemented if air sparging caused benzene to migrate up through the vadose zone at soil vapor concentrations above 122 micrograms per cubic meter (μ/m^3) at 5 feet below ground surface. The Phase 1 groundwater remediation system (AS/SVE east of Pole Creek) in the southern plume was installed, tested, and began operation in early June 2015. However, because groundwater levels have dropped due to drought, resulting in a deeper unsaturated zone that can be readily treated with SVE, the number of SVE wells has been increased to take advantage of this treatment opportunity. The system is designed to strip benzene from the LNAPL smear zone, reducing the source to a point where remaining benzene in groundwater is primarily present in the dissolved phase. The system operation has remained stable with low concentrations in perimeter monitoring points. Table B-3a summarizes the contaminant mass removed by the Phase 1 system from July 2015 through January 2016.

The Phase 2 groundwater remediation (AS/SVE west of Pole Creek) started in October 2015 with a temporary mobile SVE trailer. The trailer was used until February 2016, at which time it was removed and a permanent system was constructed. The permanent system began operating in early March. Five piezometers west of Pole Creek were converted to SVE wells to extract

vapors from the vadose zone. Table B-3b summarizes the contaminant mass removed by the mobile-trailer SVE from October 2015 through January 2016.

Table B-3a Phase 1 Petroleum Hydrocarbon Mass Removed

Date	Removal rate lbs/day			Cumulative Mass Removed in lbs		
	TPHg[a]	Benzene	Toluene	TPHg	Benzene	Toluene
6/11/2015	714	.012	0.051	1,382	0.023	0.098
6/22/2015	634	0.017	0.033	6,294	0.16	0.35
7/9/2015	484	0.011	0.029	13,638	0.32	0.79
7/23/2015	252	0.010	0.083	16,604	0.43	0.86
8/10/2015	239	0.014	0.092	19.140	0.55	0.96
8/24/2015	285	0.011	0.010	21,495	0.64	1.0
9/28/2015	352	0.0099	0.0099	30,434	0.92	1.4
11/9/2015	178	0.070	0.082	37,671	3.0	3.6
12/7/2015	346	0.014	0.018	42,865	4.1	5.0
1/4/2016	307	0.0090	0.013	49,472	4.4	5.3
1/28/2016	313	0.0092	0.013	55,801	4.6	5.6
[a] total petroleum hydrocarbon, gasoline range						

Table B-3b Phase 2 Petroleum Hydrocarbon Mass Removed

Date	Removal rate lbs/day			Cumulative Mass Removed in lbs		
	TPHg	Benzene	Toluene	TPHg	Benzene	Toluene
10/5/2015	1,726	0.26	0.12	0	0.0	0.0
10/12/2015	935	0.13	0.067	9,150	1.3	0.66
10/19/2015	814	0.10	0.062	14,869	2.0	1.1
10/26/2015	966	0.11	0.072	21,644	2.8	1.6
11/2/2015	897	0.090	0.065	27,930	3.5	2.1
11/9/2015	465	0.15	0.097	31,193	4.5	2.7
11/30/2015	470	0.16	0.098	41,076	7.8	4.8
12/7/2015	748	0.12	0.041	46,310	8.7	5.1
12/31/2015	772	0.12	0.042	64,843	12	6.1
1/4/2016	904	0.13	0.064	68,479	12	6.3
1/31/2016	904	0.13	0.064	93,043	16	8.1

4. Monitored Natural Attenuation

Monitored natural attenuation (MNA) is the only remedy for the northern groundwater plume and the final component of the remedy for the southern groundwater plume. MNA will become the final remedy in the southern plume when benzene concentrations reach a target concentration of 100 µg/L. Overall, groundwater concentrations are trending towards the remedial objectives established for the Site. A description of the MNA status for each groundwater plume is summarized in the 2015 First Semi-annual Groundwater Compliance Monitoring Report (Chevron, 2015).

4.1 Northern Groundwater Plume

The northern groundwater plume is centered on monitoring well EW-P2. Benzene concentrations continue to decline in this well from its historical maximum of 2,400 µg/L to <0.5 µg/L, below the MCL of 1 µg/L, in 2015. It should be noted that when reviewing long-term trends, concentration spikes are expected periodically but, consistent with historical trends, each spike has been lower than the previous one indicating the plume is naturally degrading and there is no new source. Sulfate reduction continues to be the dominant attenuation pathway for MNA. A trend graph from the Second Semi-annual 2015 Monitoring Report shows progress toward the remedial goal for the northern groundwater plume:

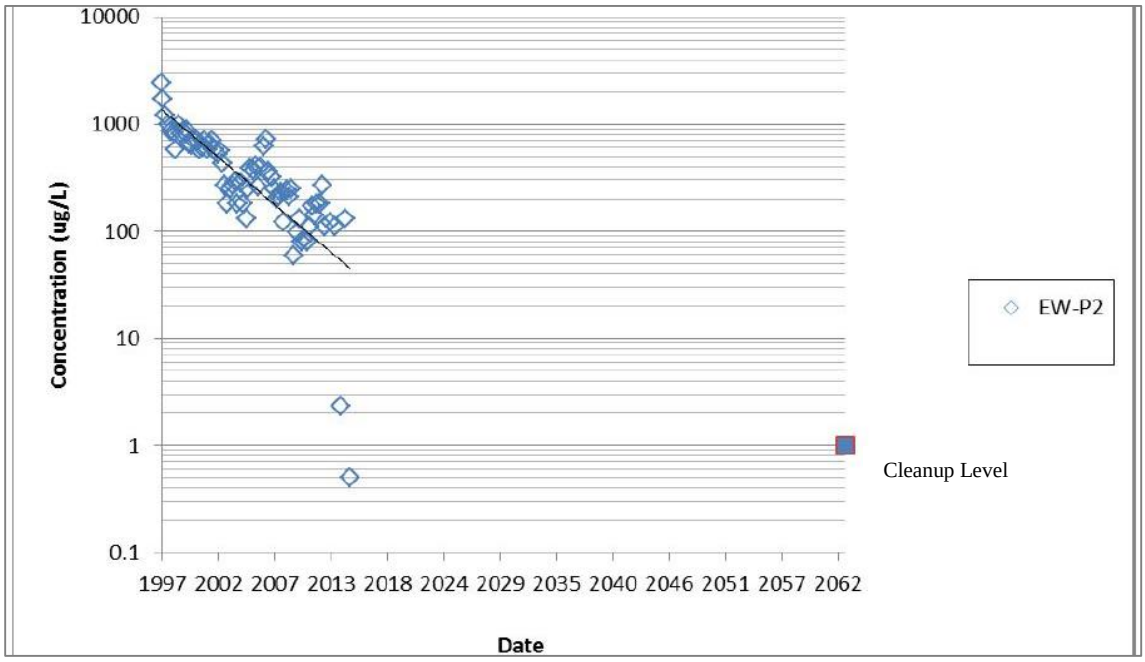

Figure B-4 – Benzene Trend in Well EW-P2

4.2 Southern Groundwater Plume

The southern groundwater plume is roughly centered on groundwater monitoring wells MW-39S and MW-50S (i.e., benzene concentrations *normally* greater than 100 µg/L), excluding those

currently containing LNAPL (EW-1, MW-55A). Similar to the northern groundwater plume, benzene concentrations continue to decline from their historical maximums. The table below includes data from 2014 groundwater monitoring reports. Data from the most recent reporting period was not used because the wells were dry.

Well	Historical Maximum Benzene in µg/L	Current Concentration Benzene in µg/L	Reduction (percent)
MW-39S	1,100	120*	89
MW-50S	670	22**	97

*indicates well is currently dry due to drought conditions and groundwater concentration shown is from the most recent available data, May 2014

**indicates well is currently dry due to drought conditions and groundwater concentration shown is from the most recent available data, November 2014

Residual LNAPL and lower groundwater levels are likely contributing to concentration spikes. Groundwater elevations continue to be depressed resulting in dry wells and/or significant drop in groundwater concentrations beneath the Site. The recently exposed smear zone presents an opportunity to use vapor extraction to greater effect.

The Phase 1 groundwater AS /SVE system began operating in June 2015. The system is designed to strip benzene from the LNAPL smear zone, reducing the source to a point where remaining benzene in groundwater is primarily present in the dissolved phase. The next phase of the remedy, if needed, will enhance biodegradation of the dissolved phase by mixing naturally occurring sulfate-rich groundwater from the deeper portion of the aquifer with the shallower plume. Once benzene concentrations throughout the southern plume are consistently below the performance goal of 100 µg/L, the long-term remedy of MNA will be implemented.

Appendix C: 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. There have been no revisions to laws or regulations that affect the protectiveness of the remedy.

Chemical-specific ARARs identified in the selected remedy within the ROD Amendment for groundwater at this Site and considered for this FYR are shown in Table C-1

Table C-1. Summary of Groundwater ARAR Changes

Contaminants of Concern	2011 ROD Amendment Cleanup Level (µg/L)	State MCL[1] (µg/L)	Federal MCL[2] (µg/L)	Is the cleanup goal above the current MCL?
Benzene	1	1	5	No
Toluene	150	150	1,000	No

[1] California MCLs, DLRs, and Public health Goals PHGs for Regulated Drinking Water Contaminants (September 23, 2015). Accessed 23 December 2015 http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.shtml

[2] Table of Regulated Drinking Water Contaminants. Accessed December 23, 2015 http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants

The California MCLs for benzene and toluene are the same as the respective 2011 ROD cleanup levels for these chemicals. Therefore, there is no impact on the protectiveness of these standards.

There are no relevant Federal and State laws or regulations other than the chemical-specific ARARs that have been promulgated or changed over the past five years. ARARs identified from the 1992 ROD and 2011 ROD Amendment that are no longer pertinent, now that the response action has transitioned from construction to long-term operation and maintenance (O&M) phase work, have not been considered in this analysis. For example, ARARs related to remedial design and construction are not considered if they do not continue into long-term O&M.

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

- State Water Resources Control Board Resolution No. 88-63
- State Water Resources Control Board Resolution No. 68-16 (Antidegradation Policy)

Appendix D: Risk Assessment, Human Health and the Environment

Human Health Risk Assessment Review

A baseline Human Health Risk Assessment (HHRA) for the Site was completed by the U.S. Environmental Protection Agency (EPA) in December 1991. Potentially exposed populations at and near the Site included current on-site workers, visitors, or trespassers at the Site, and nearby offsite workers and potential future residents.

Potential exposure pathways identified in the Risk Assessment included ingestion of groundwater, inhalation of volatile organic compounds (VOCs) from groundwater, direct contact with surface soil, ingestion of surface water, inhalation of VOCs in surface water, ingestion of stream sediment, and inhalation of ambient air. In addition, worker exposure to soil gas contaminants while trenching onsite was also evaluated. The risk assessment concluded that risks for domestic use of groundwater was greater than the EPA acceptable cancer risk range and the non-carcinogenic hazard index of 1.

The 1992 Record of Decision (ROD) concluded that the release of hazardous substances from the Site resulted in contamination of groundwater and presented an imminent and substantial endangerment to public health and welfare if releases from the Site were not addressed by implementing the selected remedial response (groundwater extraction and treatment, soil vapor extraction, institutional controls).

A second Remedial Investigation/Feasibility Study (RI/FS) was performed in 2011, which included a revised HHRA and screening level ecological risk assessment. Potential threats to human health from chemicals of potential concern (COPCs) encountered during historical and recent site characterization efforts were evaluated using California EPA and EPA risk assessment protocols. Receptor scenarios addressed in the HHRA correspond with current and future off-site residents and with future on-site commercial/industrial (e.g., maintenance) workers and future on-site construction/excavation workers. Relevant exposure routes of concern for soil in the HHRA included indoor and outdoor vapor inhalation, incidental soil ingestion, dermal contact, and inhalation of outdoor fugitive dust.

For carcinogenic risk in soil, benzo(a)pyrene was the primary risk driver. The total exposure for commercial workers by all routes was $1x10^{-5}$. In the construction worker scenario, no carcinogenic risk exceeded $1x10^{-5}$. The hazard indices for non-carcinogens were all less than 1.

Lead is also a COC that was evaluated based on predicting lead concentrations in the bloodstream rather than exposure concentrations or doses. The California Adult Blood-Lead Model (California OEHHA, 2009) was used to estimate blood lead levels in adults from exposures to site soils and compared to the target of 1 microgram per deciliter (µg/dL). The predicted concentrations for adult workers ranged from a low of 0.02 µg/dL to a high of 7.1 µg/dL (URS, 2011).

Site soil was successfully remediated in 2014, thus eliminating all soil pathways. Benzene is the only COC in groundwater with concentrations above the ROD Amendment cleanup level (California drinking water standard), the plume is contained and shrinking, and institutional controls prohibit groundwater use until the cleanup level is achieved, thus eliminating the groundwater pathway.

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 1992 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. And numerical screening levels are derived in the Vapor Intrusion Screening Level calculator, http://www2.epa.gov/vaporintrusion.

Investigations were conducted in 2006 and 2007 to characterize subsurface vapor conditions above the dissolved benzene plumes (URS, 2006; URS, 2007). Vertical profiles of soil vapor concentrations from groundwater to ground surface demonstrated natural attenuation occurring in the vadose zone. Vapor concentrations at depths near the surface (i.e., 7 feet below ground surface) were also compared against California Human Health Screening Levels (CHHSLs) for shallow soil gas and none exceeded the corresponding CHHSLs. Therefore, soil vapor results demonstrated natural attenuation within the vadose zone above the groundwater plumes such that a subsurface vapor migration exposure pathway does not present a risk.

EPA selected soil gas cleanup levels based on the site-specific risk assessment. After soil remediation was completed in 2014, soil vapor sampling was conducted to evaluate whether soil gas cleanup levels had been met. The maximum concentrations detected in soil gas were 0.0013 µg/L for benzene, 0.0082 µg/L for ethylbenzene and 0.013 µg/L for naphthalene (URS, 2015). These results are below the ROD Amendment cleanup levels and below current CHHSLs. Cleanup and screening levels are summarized in Table D-1.

Table D-1. Summary of Soil Gas Cleanup Levels and CHHSLs

Contaminants of Concern	2011 ROD Amendment Cleanup Level (µg/L)	State CHHSL[1] (µg/L)	Is the cleanup level above the current CHHSL?
Benzene	0.62	0.036	Yes
Ethylbenzene	7.8	0.42	Yes
Naphthalene	0.65	0.032	Yes

[1]http://oehha.ca.gov/risk/chhsltable.html (for buildings constructed without engineered fill in an unrestricted-use residential scenario)

Toxicity values: EPA's Integrated Risk Information System (IRIS) has a program that can be used 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 many COCs at the Site.

To evaluate the protectiveness of the cleanup levels for this FYR, those levels 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 exposure 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 acceptable excess lifetime cancer risk range is between $1x10^{-6}$ and $1x10^{-4}$. RSL values that fall within this range were determined to be acceptable from a risk standpoint. The non-cancer RSLs correspond to a hazard index of 1; Table D-2 below presents this comparison.

Table D-2. Comparison of Tap Water RSL to ROD Amendment Cleanup Levels

Contaminant of Concern	2015 Tap Water RSL[1] for cancer risk (µg/L)	Protective Cancer Risk Range 10^{-6} to 10^{-4} (µg/L)	2015 Tap Water RSL[1] for non-cancer hazard (µg/L)	Clean up Level (µg/L)	Is the Cleanup Level still protective?
Benzene	0.46	0.46 - 46	33	1	Yes
Toluene	N/A	N/A	1100	150	Yes

[1] - Tap Water RSLs (November 2015) http://www.epa.gov/risk/risk-based-screening-table-generic-tables

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 benzene, the tap water RSL for the cancer risk is less than the cleanup levels as noted above.

However, the cleanup standard falls within the $1x10^{-4}$ to $1x10^{-6}$ cancer risk range. Therefore, the cleanup standard is still considered protective.

Ecological Review

The 2011 RI/FS included a screening level ecological risk assessment (SLERA) that evaluated soil-related exposure pathways associated with terrestrial receptors. The hillside (AOC 1) was the only portion of the site that had native habitat and warranted a SLERA. The findings of the SLERA indicate that lead was the primary risk driver in AOC 1 soil, with ecological screening levels that were exceeded for all receptor groups at the surface and exceeded for burrowing mammals in subsurface soils. The following exposure pathways were presented as complete and potentially significant:

- Direct contact (uptake or dermal contact) with surface soil by terrestrial plants and soil invertebrates;
- Incidental ingestion and food web exposures originating from surface soil by terrestrial birds and mammals; and
- Incidental ingestion of subsurface soil by burrowing mammals.

The SLERA indicated that lead in soil was the only contaminant presenting unacceptable ecological risk and that action was warranted (EPA. 2011).

Soil with lead concentrations above the SLERA cleanup levels was removed in 2013. Confirmation sampling was conducted in spring 2014; results showed that lead concentrations were below the cleanup levels, indicating that the exposure pathway for ecological receptors had been eliminated.

Appendix E: Press Notices

Ventura County Star:

Thursday, March 24, 2016

Marsha Gay Reynolds surrendered to federal authorities Wednesday at John F. Kennedy International Airport.

He says Reynolds is expected to be in federal court in Brooklyn on Thursday.

formation to the communist nation between 2008 and 2014. Companies targeted including Boeing.

The 50-year-old Su faces five years in prison at his sentencing July 13. He had faced 30 years before the agreement.

which owns two solar energy facilities in Southern California.

The agency did not release the price it will pay for its Desert Sunlight stake.

Wire services

adequate," the audit concluded, even after years of development. It "lacks critical functionality needed to process applications and

2012. The system was scheduled to be operational by the end of 2014, but that deadline passed long ago.

Own a piece of history

The Ventura Historical Mural

Ventura is celebrating its 150th anniversary. Please support this important historical event and acquire a fine art ceramic memorial plaque for $125 each or a set of four for $500 to help fund the Ventura Historical Mural which will permanently grace Mission Park and our city for decades to come.

150 VENTURA 1866-2016

To purchase, please go to celebrateventura.org and click on "sponsorship opportunities."

Join these sponsors:
Smith-Hobson Foundation
Janice Willis
Limoneira
Fausset Family
Helen Yunker
Bill and Elise Kearney
EJ Harrison and Sons
Ventura County Star
Community Memorial Health System
Williams Homes

VC-SB-044-2-2

PUBLIC NOTICE

THE FOURTH FIVE-YEAR REVIEW OF CLEANUP AT THE PACIFIC COAST PIPELINE SUPERFUND SITE

The United States Environmental Protection Agency (EPA) began the fourth Five-Year Review (FYR) of cleanup actions undertaken at the Pacific Coast Pipeline Superfund Site (Site) in Fillmore, California. The review will evaluate whether the cleanup actions for the Site are protective of human health and the environment.

THE REVIEW PROCESS

Superfund law requires EPA to evaluate the protectiveness of remedial systems every five years until the Site has been deemed up sufficiently to allow unrestricted access. This FYR will address both the groundwater and soil cleanup actions taken at the Site. Upon completion of the review due September 20, 2016, the final report will be sent to the local information repository listed below and online at www.epa.gov/superfund/pacificcoastpipeline. The Site will continue to be monitored and the next FYR is in 2021.

SITE HISTORY

The Pacific Coast Pipeline Superfund Site is a former petroleum refinery that operated from 1915 to 1950. The primary product of the refinery was gasoline. Refinery wastes were disposed of onsite in a large waste pit located along the western boundary of the Site and eight smaller unlined pits throughout the Site. In 1950, Texaco shut down and dismantled the refinery, converting it to a crude oil pumping station. In 1985, Texaco removed 38,000 tons of contaminated soil from the Site and installed groundwater monitoring wells.

CLEANUP

In 1989, the EPA Superfund Program began oversight of the cleanup. In 1992, Texaco installed a pump and treat system to clean up benzene and toluene in groundwater. The system operated for 12 years until it reached its limit of effectiveness. In 2011, EPA selected a new remedy to address the remaining groundwater contamination and to clean up soil contaminated with lead and polycyclic aromatic hydrocarbons. No one is drinking this water. The soil cleanup was conducted in 2013-2014 and the property can now be used for commercial activities.

COMMUNITY INVOLVEMENT

If you would like to participate in the FYR process or be added to the Site mailing list, please contact Jackie Lane, Community Involvement Coordinator, at (415) 972-3236 or by email at lane.jackie@epa.gov. For more Site information, please visit EPA's website at www.epa.gov/superfund/pacificcoastpipeline. For specific questions about the Site cleanup, please contact Holly Hadlock, Project Manager, at (415) 972-3171 or hadlock.holly@epa.gov.

Site information is located at the Fillmore Library, 502 2nd Street, Fillmore, CA and at the EPA Superfund Records Center, 75 Hawthorne St. Suite 3110, San Francisco, CA 94105, (415) 947-8717.

VC-SB-044-2-2

CN5-285557-Alt

The Fillmore Gazette:
Thursday, April 28, 2016

19 - 22, 2016

TH, 2016, 5-11PM ★ FRIDAY MAY 20TH, 2016, 5-11PM
, 2016, 12-11PM ★ SUNDAY MAY 22ND, 2016, 12-8PM

. TICKETS- $15/ SHEET OF 20 (NOT VALID FOR THURSDAY $1 DAY)
NDS- $25 FOR SATURDAY OR SUNDAY 12-7
246 CENTRAL AVENUE (805)524-0351

DAY: DOLLAR DAY $1
Y-SATURDAY: ADULTS 12 AND UP $5, CHILDREN 5-11 $3
REN 4 AND UNDER FREE
AY SPECIAL EVERYONE ENTERS FOR THE PRICE OF A CHILD $3!

DR. JON SCHROCK KITCHEN & GARDEN

DOUG GREEN & BRIAN KIESOW HOUSE

HANGARS at SANTA PAULA AIRPORT:
JUDY PHELPS at CP AVIATION & WILMA MELVILLE

For Tickets & Information:

(805)525-1333

the home support group

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sy.

Track Access Gate Open to Public

Track access gate is available to the public. To get access to the track, come to City Hall, pay a $25 annual fee, fill out the required paperwork and sign out a scan card. Available hours for public use of the track: Monday – Saturday: 6:00 a.m. – 8:00 a.m. & 9:00 p.m. – 10:00 p.m. Sundays: 6:00 a.m. – 10:00 p.m. For more information please call the city hall at 524-3701.

VACATION BIBLE SCHOOL

Bardsdale United Methodist Church invites children ages 4 years to seniors to Surf Shack: Catch the Wave of God's Amazing Love Vacation Bible School. The fun begins Monday June 27 to Friday July 1st from 9 to noon. Yes, we are having an early VBS this

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CNS-2855903#

• EUREKA • SHARP • ROYAL • PANASONIC • KIRBY •

BAILEY'S

Vacuum Cleaners & Appliance Parts

BAGS / BELTS / PARTS / SALES / SERVICE

Appendix F: Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Pacific Coast Pipeline	**Date of inspection:** February 8, 2016
Location: Ventura County, California	**EPA ID:** CAD980636781
Agency, office, or company leading the five-year review: US EPA	**Weather/temperature** 76 F, sunny, easterly winds gusting to 35 mph

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: e.g. Groundwater monitoring
- ☒ 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** Zach Gautsch (Name) Lead Field Engineer (Title) 2/8/16 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____
   No problems. Suggestion re. condensation issue and recommendation. Will be mentioned in semi-annual gw. report

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

Inspection participants:
Holly Hadlock, EPA
Leslie Klinchuch, Chevron
Jon Sanks, AECOM
Zach Gautsch, AECOM
Peter Stumpf, AECOM

1

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 Ventura County Fire
Contact Pete Jensen (Name) Haz Mat Officer (Title) 2/19/16 (Date) 805-383-4752 (Phone no.)
Problems; suggestions; ☐ Report attached Phone call - no issues

Agency City of Fillmore, Planning Dept.
Contact Kevin McSweeney (Name) Comm. Develop. Director (Title) 2/19/16 (Date) 805-524-1500 x 116 (Phone no.)
Problems; suggestions; ☐ Report attached Phone call - no issues. Solar farm is planned, no sewage or traffic issues so County, not City, has the lead.

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.

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

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 → part of HSP and in O&M Manual

2

3.	**O&M and OSHA Training Records** Remarks	☒ Readily available	☒ Up to date	☐ N/A
4.	**Permits and Service Agreements** ☒ Air discharge permit ☐ Effluent discharge ☐ Waste disposal, POTW ☒ Other permits Fire code (propane tank) Remarks Encroachment permit / County for well access Caltrans	 ☒ Readily available ☐ Readily available ☐ Readily available ☒ Readily available	 ☒ Up to date ☐ Up to date ☐ Up to date ☒ Up to date	 ☐ N/A ☒ N/A ☒ N/A ☐ N/A
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 In the site log ☐ Water (effluent) Remarks	 ☒ Readily available ☐ Readily available	 ☒ Up to date ☐ Up to date	 ☐ N/A ☐ N/A
10.	**Daily Access/Security Logs** Remarks	☒ Readily available	☒ Up to date	☐ N/A

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IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP AECOM
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other

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:

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

A. Fencing

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

Remarks Fencing not required by EPA. Treatment system is secured

B. Other Access Restrictions

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

Remarks

4

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) cap - visual inspection gw - sampling
Frequency annual cap inspection / gw semi-annual
Responsible party/agency Chevron
Contact Leslie Klinchuch
Name Title Date 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

Soil and groundwater land use covenants are being finalized

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

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

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

5

B. Other Site Conditions

Remarks

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_____ Widths_____ Depths_____
   Remarks

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

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established
   NA ☐ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks

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		
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		

7

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

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E. Gas Collection and Treatment		☐ Applicable	☒ N/A
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks		
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks		
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks		
F. Cover Drainage Layer		☐ Applicable	☒ N/A
1.	**Outlet Pipes Inspected** Remarks	☐ Functioning	☐ N/A
2.	**Outlet Rock Inspected** Remarks	☐ Functioning	☐ N/A
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		
4.	**Dam** ☐ Functioning ☐ N/A Remarks		

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H. Retaining Walls	☐ Applicable	☒ N/A
1. **Deformations** Horizontal displacement_____ Vertical displacement_____ Rotational displacement_____ Remarks	☐ Location shown on site map	☐ Deformation not evident
2. **Degradation** Remarks	☐ Location shown on site map	☐ Degradation not evident
I. Perimeter Ditches/Off-Site Discharge	☒ Applicable	☐ N/A
1. **Siltation** Areal extent_____ Depth_____ Remarks	☐ Location shown on site map	☒ Siltation not evident
2. **Vegetative Growth** Areal extent_____ Type_____ Remarks	☐ Location shown on site map ☒ Vegetation does not impede flow	☐ N/A
3. **Erosion** Areal extent_____ Depth_____ Remarks	☐ Location shown on site map	☒ Erosion not evident
4. **Discharge Structure** Remarks	☒ Functioning	☐ N/A
VIII. VERTICAL BARRIER WALLS	☐ Applicable	☒ N/A
1. **Settlement** Areal extent_____ Depth_____ Remarks	☐ Location shown on site map	☐ Settlement not evident
2. **Performance Monitoring** Type of monitoring_____ ☐ Performance not monitored ☐ Evidence of breaching Frequency_____ Head differential_____ Remarks		
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		

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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

2. **Surface Water Collection 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

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
Air sparging, in-situ

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

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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. SVE - treatment compound dual use w/ air sparging

Wells - 6 air sparge
6 dual
currently SVE
10 monitor points - piezom (2 east, 8 west)
1 gw monitoring + SVE (east)

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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.). The soil remedy accomplished the goal of ~~cleaning~~ removing contaminated soil to levels that allow for commercial development. The capped consolidation areas are functioning as designed. The gw remedy goal is to clean up to drinking water standards. It is functioning as designed.

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.

Soil - O&M is adequate; no issues. No current risk to long-term protectiveness

Groundwater - O&M is adequate, treatment system regularly runs 24 hrs/day. Remedy is protective as no one is allowed to drink the water.

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.

No potential problems were observed or mentioned by O&M Site Manager.

D. Opportunities for Optimization

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

There are no optimization opportunities right now. The soil remedy is complete and the gw remedy is less than a year old.

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Appendix G: Photographs from Site Inspection Visit

Site, Looking North

Site, Looking South

Texaco Pacific Coast Pipeline Superfund Site

Main Consolidation Area, Looking North

Supplemental Consolidation Area

Consolidation Area Cap Sign

Northern Retention Basin

Southern Retention Basin

Air Sparge / SVE Treatment Compound

Air Sparge Compressor

SVE System Oxidizer