

FINAL

First Five-Year Review Report

for

Jasco Chemical Company Superfund Site

Mountain View

Santa Clara County, California

September 28, 2007

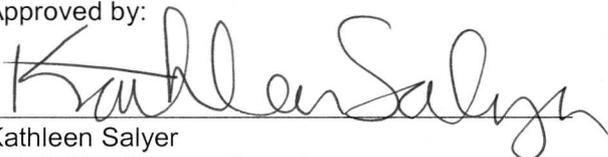
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Five-Year Review Report

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Attachments

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Appendix

Comments received from Support Agencies, PRPs, and the Community

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
ESD	Explanation of Significant Difference
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCE	Tetrachloroethene
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SDWA	Safe Drinking Water Act
TCE	Trichloroethene
VOC	Volatile Organic Compound

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Executive Summary

The Environmental Protection Agency, Region 9 has conducted the first five year review (FYR) of the Jasco Chemical Company Superfund Site in Mountain View, California. The purpose of the FYR is to determine whether the remedial actions implemented at the site are protective of human health and the environment.

The remedy for the Jasco Site addressed contaminated groundwater and soil. The selected remedy consists of groundwater extraction, treatment, and disposal; soil excavation and off-site disposal; and on-site bio-treatment and dual vacuum extraction/soil vapor extraction (DVE/SVE) of contaminated soils. The site remedy also required deed restrictions to prohibit use of the groundwater for drinking and to control subsurface activities. The site reached cleanup levels for groundwater and soils in March 2002, with the Preliminary Closeout Report (PCOR) signed on September 20, 2002. This is the date EPA is using as the trigger for this five-year review.

An off-site plume of tetrachloroethene (PCE) contaminated groundwater was discovered during the remedial investigation and operation of the remedy at the Jasco Site. While EPA has determined that the source of the groundwater PCE contamination is not the Jasco site, the plume does impact the site. Given that the plume could impact future use of the site, a 2002 Explanation of Significant Differences (ESD) for the site added a Section 1471 Environmental Restriction institutional control to the selected remedy. The Environmental Restriction is a specific type of deed restriction under State law that runs with the land. At the Jasco site, the Environmental Restriction will restrict groundwater use and subsurface activities. Further investigation of this plume is recommended to ensure long-term protectiveness of the remedy.

This FYR found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD) and ESD. The remedy functioned as it was designed and has met soil and groundwater cleanup standards.

Although the institutional control has not been implemented, the overall remedy for both soil and groundwater is considered protective of human health and the environment in the short-term since there is no evidence of a compete exposure pathway. The remedy is expected to continue to be protective for the foreseeable future.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Jasco Chemical Company		
EPA ID (from WasteLAN): CAD009103318		
Region: 9	State: CA	City/County: Mountain View / Santa Clara
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: 9/20/2002	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Travis Shaw & Jeff Powers		
Author title: Technical Lead & Geologist	Author affiliation: USACE Seattle District	
Review period:** 9/15/2002 to 9/15/2007		
Date(s) of site inspection: 4/20/2007 (conducted by Rusty Harris-Bishop, EPA RPM)		
Type of review:		
<input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action:		
<input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at Groundwater Remedy <input checked="" type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify) Preliminary Closeout Report (PCOR)		
Triggering action date (from WasteLAN): 9/20/2002		
Due date (five years after triggering action date): 9/20/2007		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

The Section 1471 Environmental Restriction (deed restriction) has not been recorded in the Santa Clara County Clerk's Official Record index. This institutional control is required by the 2002 ESD.

PCE contaminated groundwater has migrated onto the site from an off-site source. While EPA has determined that the Jasco site is not the source of the PCE contamination, the extent of the plume has not been fully delineated in the subsurface.

Although the current analysis shows that the PCE plume does not present a risk from vapor intrusion, the analysis relies on groundwater data rather than soil gas samples.

Recommendations and Follow-up Actions:

Ensure that Section 1471 Environmental Restriction has been officially recorded with the Santa Clara County Clerk's office.

Work with the State of California and other interested parties, to delineate the extent, scope, and risk of the PCE plume.

Confirm the vapor intrusion risk assessment results using soil gas samples.

Protectiveness Statement(s):

The overall remedy at the Jasco Chemical Superfund Site for both soil and groundwater is considered protective of human health and the environment in the short-term since there is no evidence of a complete exposure pathway. The remedy is expected to continue to be protective for the foreseeable future. To ensure long-term protectiveness, the institutional control needs to be recorded with Santa Clara County until the off-site PCE plume is delineated and addressed.

Other Comments:

None

Five-Year Review Report

I. Introduction

The purpose of the five-year review (FYR) is to determine whether the remedy at the Jasco Chemical Company Superfund site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, the FYR report identifies issues found during the review and recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This FYR was conducted for the United States Environmental Protection Agency (EPA) Region 9 by the Seattle District, U.S. Army Corps of Engineers (USACE) at the Jasco Chemical Company Superfund Site in Mountain View, California. This review was conducted by the Remedial Project Manager (RPM), Seattle District staff and representatives of Jasco Chemical Corporation and Mr. & Mrs. Harry M. and Carol Jean Anthony (the property owners) from March 2007 to July 2007. This report documents the results of the review.

This is the first FYR for the Jasco Chemical Company Superfund Site. The triggering action for this review is the PCOR date: September 20, 2002. It is the policy of EPA to review remedies that take longer than five years to complete, to verify the continued protectiveness of the completed remedy.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Jasco starts operations at the site.	December 1976
Private citizen complains of solvents being dumped at the site.	January 1983

Table 1: Chronology of Site Events

Event	Date
California Regional Water Quality Control Board requests installation of monitoring wells to determine if groundwater had been contaminated.	June 1983
A preliminary investigation confirms the presence of contamination, including PCE, in site soil and groundwater.	June 1984
Jasco Chemical Co. begins extracting contaminated groundwater that is treated and discharged to the City of Mountain View sewer system.	February 1987
California Regional Water Quality Control Board issues Cleanup and Abatement Order No. 87-094 requiring Jasco to conduct a remedial investigation.	August 1987
EPA issues an Administrative Order requiring Jasco to complete a Remedial Investigation/Feasibility Study.	December 1988
Jasco Chemical Company site listed on the NPL.	October 1989
Remedial Investigation/Feasibility Study complete. (PCE not detected in monitoring wells after 1989.)	February 1991
Proposed Plan distributed for public review.	June 1992
ROD signed.	September 1992
PCE contaminated groundwater is discovered on-site.	1993
The EPA approved dual vacuum extraction/soil vapor extraction (DVE/SVE) pilot test system begins operation to evaluate the technology as a remedy for contaminated soil and groundwater.	1995
Soil remedy conducted.	April 1995 – February 1998
PCE response begins with conversion of a monitoring well to DVE.	April 1997
Soil confirmation sample results indicate soil cleanup goals have been achieved.	February 2002
Memo releasing Jasco from sampling under buildings and canopy sent to Jasco from EPA.	March 5, 2002
Groundwater extraction and treatment system shut-off.	March 2002
Explanation of Significant Differences finalized modifying the treatment methods for both soil and groundwater and the deed restriction requirements.	September 2002
Final Soil Remediation Report issued.	July 2002
Construction completion achieved. PCOR signed.	September 2002

III. Background

Physical Characteristics

The Jasco Chemical Company Superfund Site consists of a 2.05 acres located at 1710 Villa Street in the City of Mountain View, CA. The area is residential, dominated by single family homes to the south and the Villa Mariposa apartment complex to the east. Single and multifamily housing is located on Higdon Ave on the western border of the site. Villa Street is on the south side of the site and a Southern Pacific Railroad right-of-way borders the site on the north. The Jasco site is at an approximate elevation of 60 feet above mean sea level with local topography that slopes gently to the north-northeast. Permanente Creek is the only water body near the site, located about 600 feet northwest of the site. The creek is a perennial, concrete lined channel used primarily for drainage and flood control that drains into San Francisco Bay.

Land and Resource Use

Historically, the Jasco site has been zoned for industrial use. Prior to 1970 the site was zoned as General Industrial and 85% of the property was occupied by the Pacific Press Publishing Association, an industrial printing/publishing concern. With the closure of the Press in 1983, the City of Mountain View reconsidered basic land use provisions in the area. The resulting Villa-Mariposa Area Precise Plan provides for a transition of this older industrial complex into a residential area. The property is currently zoned P (planned community) and industrial/office uses are viewed as nonconforming under the Master Development Plan. Consequently, the Jasco Chemical facility was a nonconforming use and its use was to be terminated by December 1993. This date was extended by the Environmental Planning Commission to December 1995 to allow the facility to remain operating.

There are eight municipal water supply wells within a three mile radius of the site. The City of Mountain View's Well #17 is located approximately 2,000 feet northwest of the Jasco site. This well was shut off in December 1986 due to concerns that contamination at the Jasco site might impact the well. Pumping was restarted in Well #17 in 1988 once it was determined that the well was not impacted.

There are a number of beneficial uses of both surface and groundwater in this area. Local surface waters include Permanente Creek and San Francisco Bay. The existing and potential beneficial uses of these surface waters include fish and wildlife habitat, navigation, fishing, shellfish harvesting and industrial service supply. The existing and potential beneficial uses of the groundwater underlying the site include industrial process water supply, municipal and domestic water supply and agricultural water supply.

History of Contamination

Jasco's production process involved repackaging bulk chemicals into small containers and blending compounds to produce proprietary products such as degreasers and paint thinners. Bulk solvents were received in tankers and stored in eight underground storage tanks. Powdered solids were received in 55 lb bags and other solvents were received in 55 gallon drums.

A private citizen complained of solvents being dumped at the site in January 1983. The California Regional Water Quality Control Board (RWQCB) requested the installation of monitoring wells at the site to determine if groundwater had been contaminated. A subsequent preliminary groundwater investigation conducted in June 1984 revealed the presence of chemicals in soil and groundwater of the same type as those used and stored at the Jasco facility. These chemicals included 1,1,1-trichloroethane, acetone, creosote, denatured alcohol, kerosene, lacquer thinner, methanol, methylene chloride and paint thinner. A subsequent groundwater sample obtained in April 1985 showed the presence of pentachlorophenol and methylene chloride.

Initial Response

In February 1987, Jasco began extracting contaminated groundwater at the site. The extracted groundwater was discharged to the Mountain View sewer system under a permit from the city.

On October 2, 1987, the company removed an underground diesel tank from the site. The tank was corroded with numerous small holes. Samples taken from directly beneath the tank contained diesel, benzene, toluene and xylene.

After completing a soils characterization report and runoff management plan in August 1988, Jasco initiated an interim action. The company removed 572 cubic feet of contaminated soil down to the water table (22-28 feet below ground surface) from the drainage swale (the grassy drainage area located on the northeastern boundary of the site, between the Jasco property and the railroad right-of-way) in October 1988. A surface water collection system was installed in the area of the soil removal to prevent further surface water infiltration. The system consisted of a polyethylene liner that prevents surface water percolation. The area was also graded to direct surface flow toward a sump for collection and discharge to the sanitary sewer system.

Basis for Taking Action

The actual or threatened releases of hazardous substances from the Jasco Chemical Company Superfund Site, if not addressed by implementing the response actions described in the ROD, would have represented an imminent and substantial danger to human health or the environment. Contaminant concentrations in groundwater represented the greatest risk to potential residential users of site groundwater. The threat posed by soil contamination was the continued degradation of surface and groundwater resources. The purpose of the response action described by the ROD was to prevent any further migration of contaminants into the groundwater, prevent possible future exposure of the public to contaminated groundwater and prevent contamination of the drinking water aquifer.

The contaminants of concern (COCs) found at the site are:

Groundwater and Soil

Acetone
Benzene
Chloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethane
cis-1,2-Dichloroethene
Diesel or kerosene mixture
Ethybenzene
Methanol
Methylene chloride
Methyl ethyl ketone
Pentachlorophenol
Toluene
1,1,1-Trichloroethane
Tetrachloroethene
Trichloroethene
Vinyl chloride
Xylene

Surface Water

Methylene chloride
Pentachlorophenol
1,1,1- Trichloroethane
1,1-Dichloroethane

IV. Remedial Actions

Remedy Selection

The ROD for the Jasco Chemical Company Superfund Site was signed on September 30, 1992. Remedial Action Objectives (RAO) were developed from the data collected during the Remedial Investigation to aid in the development and screening of remedial alternatives to be considered for the ROD. The ROD for the site identified contaminated soil and groundwater as the principal threats at the site. RAOs for the Jasco site are:

- Prevent any further migration of contaminants into groundwater by treating site soils.
- Prevent possible future exposure of the public to contaminated groundwater.
- Prevent contamination of the drinking water aquifer by treating both contaminated soil and groundwater.

Interim actions had largely addressed concerns related to the contamination of surface water.

The major components of the remedy selected in the ROD included the following:

1. On-site construction of a liquid phase carbon absorption groundwater treatment plant. Treated groundwater was to be discharged to the sanitary sewer system under permits with the City of Mountain View (No. 491010 and 491520). Continued groundwater treatment until all present and future wells at the Jasco site met cleanup standards.
2. The groundwater pump and treat system would operate so that hydraulic control of the site was maintained to prevent vertical and horizontal expansion of the contaminated groundwater plume.
3. Quarterly groundwater monitoring of all monitoring and extraction wells on the Jasco site to verify progress toward cleanup standards and to demonstrate that hydraulic control was maintained. The frequency of monitoring decreased to tri-annually two years after confirmation that soil cleanup standards had been achieved. Sampling of groundwater could decrease to bi-annually once cleanup standards were met in all wells and stabilized for one year.
4. Installation of additional monitoring and extraction wells at locations determined by EPA to improve the performance of the extraction and treatment system.
5. Treatment of all site soils in the drainage swale contaminated above cleanup standards using an on-site *ex situ* biological treatment reactor. The operation of the reactor included nutrient amendment of the contaminated soil and an aeration system. The aeration system would have an activated carbon absorption system. Spent carbon used in this system would be disposed of off-site at a permitted facility.
6. Sampling of soil beneath the production facility, the drum storage area and the underground storage tank area within six months of the treatment of soils from the drainage swale. If soils were contaminated above cleanup standards, soil in these areas would be treated in the *ex-situ* bio-reactor.
7. Site soils that contained residual contaminant concentration after on-site biological treatment would be disposed of off-site.
8. The property owners were required to file a restrictive easement in the official Records of the County of Santa Clara prohibiting the use of on-site shallow groundwater as drinking water and restrict subsurface activity that might mobilize contaminants or create a complete exposure pathway. The restrictive easement would remain in place until soil and groundwater cleanup standards were achieved.

An ESD was issued on September 13, 2002. The ESD documented modifications of three elements of the remedy selected in the ROD. The modifications are described below:

1) Groundwater treatment was modified to use an air stripper in combination with vapor-phase carbon absorption rather than liquid-phase carbon absorption. The change in treatment technologies was required to meet new, more stringent discharge requirements. Under the ROD, treated groundwater was discharged to the sanitary sewer system under a permit with the City of Mountain View. As part of the facility closure plan process with the City, the POTW permit Jasco operated under was not renewed. Treated groundwater was therefore discharged to surface water (Permanente Creek) under a General NPDES permit with the Regional Water Quality Control Board (RWQCB). To meet the new discharge requirement, the treatment system needed to be modified to treat contaminants to the State maximum contaminants levels (MCLs).

2) Soil treatment in the drainage swale area was modified to allow *in situ* soil vapor extraction (SVE) rather than *ex situ* enhanced bioremediation. This modification was required by the change in ownership of the adjacent rail line. Under the ownership of the Joint Powers Board, rules for working near commuter rail lines changed and that made excavation difficult. Jasco requested that EPA evaluate SVE as an alternative. The pilot system achieved remediation goals in the drainage swale and eliminated the need to use the bioremediation system.

3) The ROD for the Jasco site required a deed restriction be placed on the property until soil and groundwater cleanup goals were achieved to prevent possible exposure to contaminated media. After the ROD was finalized, a distinct PCE plume was discovered at the site. EPA and the RWQCB concluded that the PCE plume did not result from Jasco operations and that the source was off-site. However, since site groundwater was impacted and the Jasco site cleanup would not remediate the PCE plume, restrictions on groundwater use and subsurface activities would remain in place until the PCE plume was addressed.

The ESD required a deed restriction that would be recorded as an Environmental Restriction under Section 1471 of the California Civil Code and would run with the land. Activities that might disturb the effectiveness of the extraction and monitoring system or cause the release of contaminants from the vadose zone of the groundwater in the aquifer (i.e. excavation, grading, removal, trenching, filling, earthmoving or mining) would be restricted.

Remedy Implementation

The Remedial Action at the Jasco site was implemented by Jasco Chemical Corporation and Mr. Harry M and Mrs. Carol Jean Anthony, the property owners, and began in the winter of 1994 with EPA approval for the installation of a pilot scale dual vacuum extraction/ soil vapor extraction (DVE/SVE) system for the drainage swale area of the site. The purpose of the pilot test was to evaluate DVE/SVE as a remedy for the cleanup of soil and groundwater and began operating in 1995. The system operated successfully until February 1998.

In April 1997, Jasco voluntarily converted a monitoring well to DVE. Jasco subsequently converted an additional monitoring well to DVE in order to remove PCE from a perched groundwater zone and prevent further PCE migration (see Additional Site Investigation Associated with PCE Contamination). These converted DVE wells remained in operation until April 1998 when the expanded groundwater extraction and treatment system was completed.

Jasco reached construction completion on September 20, 2002. A preliminary closeout report (PCOR) documented that the construction of the cleanup remedy was complete.

Additional Site Investigations associated with PCE contamination

PCE was initially detected in low concentrations in sampling from 1984-1989. PCE was not detected again until 1993, when it was found in well I-2 in the B-zone aquifer, located within the median of the Central Expressway. In April 1995, PCE was detected in the A-zone aquifer in well V-10 at the westernmost edge of the property. It was also detected in soils on the Jasco property at very low levels. In 1997 and 1998, Jasco conducted a field investigation focusing on the source of the newly found PCE. Forty-four hydropunch sampling locations were used to estimate the extent of the PCE plume. The furthestmost sample was 1000 feet downgradient from the property and contained 84 ppb of PCE in the B-zone aquifer. In the A-zone, PCE was detected as far as 100 feet north of the Central Expressway.

In the PCE Report dated December 2000, Jasco presented the findings of these investigations. Jasco concluded that the source of PCE was not associated with the operation at Jasco and that the source appeared to be located on the property immediately to the east of the Jasco property. Jasco also inferred that the release might have pre-dated the operations at Jasco due the large extent of the PCE plume. EPA agreed that the PCE was not attributable to the operations at Jasco and documented this finding in the 2002 ESD and PCOR.

To evaluate the potential risk to future construction workers or residents at the site, Jasco collected soil vapor samples in November 2002. These samples were collected on the western edge of the Jasco property near the area of highest groundwater contamination. The analytical results from these samples were then used by the City of Mountain View to produce a Human Health Risk Assessment for PCE in Soil and Soil Vapor in January 2003. The results of the risk assessment indicate that PCE vapors would not pose an unacceptable risk for future construction workers or for future residents. EPA reviewed the Risk Assessment and concurred with the conclusions; however, due to the uncertainties in the assessment, EPA recommended that any future development install a vapor barrier and indoor air monitoring be conducted to verify the conclusions in the risk assessment. As mentioned above, EPA also required an Environmental Restriction under Section 1471 of the California Civil Code in the 2002 ESD, that will run with the land.

System Operation/Operations and Maintenance

The groundwater extraction and treatment system was shut off and has not been in operation since March 2002. Also, the soil vapor extraction and treatment system to treat drainage swale soil contamination was shut off and has not been in operation since February 1998. Since there was no active treatment system on site in operation during the period of this Five Year Review, no system performance or operation and maintenance data were available for evaluation.

V. Progress Since the Last Review

This is the first five-year review for the site.

VI. Five-Year Review Process

Jasco Chemical Corporation and Harry M. and Carol Jean Anthony were notified of the initiation of the five-year review on April 17, 2007. The Jasco Five-Year Review Team was led by Rusty Harris-Bishop of EPA, Remedial Project Manager (RPM) for the Jasco Site and included personnel from the U.S. Army Corps of Engineers, Seattle District, with experience in hydrogeology, chemistry and risk assessment.

Beginning in December 2006, the review team established the review schedule whose components included:

- Community Involvement;

- Document Review;
- Data Review;
- Site Inspection;
- Local Interviews; and
- Five-Year Review Report Development and Review.

Community Involvement

There has been no recent community involvement at this site. An advertisement was taken out in two papers in the vicinity, *The San Jose Mercury News* and *The Mountain View Voice*, to announce the availability of the Five Year Review.

Document Review

This five-year review consisted of a review of relevant documents including monitoring data (See Attachment 2). Applicable groundwater cleanup standards, as listed in the 1992 Record of Decision, were reviewed.

Data Review

Soil and groundwater data associated with remedial actions implemented based on the ROD (USEPA 1992) and ESD (USEPA 2002) were reviewed and evaluated for the Jasco site. All data were obtained from document reviews. The following lists are compilations of all project-related documents reviewed in support of the soil and groundwater data assessments:

Soil:

- Revised PCE Report (Dec 2000)
- Field Audit Report of Soil Sampling (Mar 2002)
- Release of Need to Sample Under Office Building and Canopy Memo (Mar 2002)
- Revised Final Remedial Action Report for Soil (July 2002)

Groundwater:

- Revised PCE Report (Dec 2000)
- 2001 Groundwater System Annual Report (Jan 2002)
- 2002 Groundwater System Annual Report (Jan 2003)
- Results of Groundwater Monitoring Program and Quarterly Progress Reports (covering quarterly events Jan 2002, Apr 2002, Jul 2002, Oct 2002, Jan 2003, Apr 2003, Jul 2003, Oct 2003, Jan 2004, Apr 2004, Jul 2004, Oct 2004, Jan 2005, Apr 2005, Jul 2005, Oct 2005, Jan 2006, Apr 2006, Jul 2006)

Groundwater data, both analytical and hydraulic, were reviewed from all on site monitoring and extraction wells and piezometers for which data was collected. This includes A-aquifer wells (“V” designation for monitoring, “EW” for extraction) and piezometers (“P” designation): V-1, V-4, V-5, V-6, V-7, V-8, V-9, V-10, V-11, V-12, P-1, P-2, P-3, P-4A, and P-5A (and intermittently saturated perched zone well EW-6A). B-aquifer well data were also reviewed from all on site B-aquifer wells (“I” designation for monitoring) and piezometers: I-2, I-3, EW-7, P-4B, and P-5B. Note the shallower A and deeper B aquifers are local designations; both of these units are considered to be part of the upper aquifer zone of the confined area of the Santa Clara Valley groundwater basin (USEPA 1992). A summary of all site monitoring wells is included in Table 2, below.

Table 2. Groundwater Monitoring Well Summary

Well ID	Screened Water-Bearing Zone	Well Head Elevation (msl)	Screen Elevation (msl)	Current Sample Frequency for VOCs ¹
V-1	A-aquifer	57.96	29.96-10.96	Semi-annually
V-4	A-aquifer	58.32	30.32-23.32	Quarterly
V-5	A-aquifer	58.09	24.59-21.59	Semi-annually
V-6	A-aquifer	58.45	20.95-15.75	Quarterly
V-7	A-aquifer	56.36	32.36-20.86	Quarterly
V-8	A-aquifer	57.18	25.18-21.17	Quarterly
V-9	A-aquifer	56.41	33.41-28.41	Semi-annually
V-10	A-aquifer	58.99	33.99-26.99	Quarterly
V-11	A-aquifer	59.23	27.73-17.73	Annually
V-12	A-aquifer	58.50	27.00-17.00	--
P-1	A-aquifer	58.89	27.89-17.89	--
P-2	A-aquifer	59.73	29.23-18.73	--
P-3	A-aquifer	57.63	25.63-17.63	--
P-4A	A-aquifer	60.05	34.05-24.05	--
P-5A	A-aquifer	58.78	32.78-22.78	--
I-1	B-aquifer	59.02	12.72-1.52	Quarterly
I-2	B-aquifer	57.33	10.33-2.83	Quarterly
I-3	B-aquifer	57.07	10.57-1.07	Quarterly
P-4B	B-aquifer	59.94	17.94-3.44	--
P-5B	B-aquifer	59.45	16.45-(-)6.05	--

Notes:¹Current as of First Quarter 2006.

msl – Mean Sea Level

"--" Symbol indicates well is not currently being sampled.

Data Analysis Tools Utilized.

Plots were constructed of concentration versus time for chemicals of concern (COCs) in groundwater at the Jasco site. The existing site data were then compared to current cleanup standards for the site-specific COCs. The well data was then tested for the presence of trends. Hydrographs depicting groundwater elevation versus time for each on site well containing sufficient data were also constructed. Area precipitation was plotted on these graphs to understand the relationship between precipitation/aquifer recharge and water levels in wells.

The soil concentration data was reviewed directly from the reports, with no supplemental data interpretation. The analytical soil data analysis was more straightforward because all soil samples collected either to verify the absence of soil contamination or after completed soil remedial actions in the contaminated areas of the drainage swale and the UST area (whether ex-situ or in-situ) were below cleanup standards.

Time Period of Data.

The trigger for the five year review was the PCOR in 2002; therefore, groundwater monitoring data from the period of January 2002 to July 2006 was included in this review. The soil remedy occurred between April 1995 and February 1998, with confirmational samples also collected in February 2002, therefore soil analytical data was reviewed from the period of 1995 to 2002.

Chemicals of Concern Selected for Analysis.

The following constituents were listed as site-specific COCs for both soil and groundwater in the ROD and ESD: acetone, benzene, chloroethane, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE),

1,2-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, diesel or kerosene mixture, ethylbenzene, methanol, methyl ethyl ketone, methylene chloride, pentachlorophenol, toluene, 1,1,1-trichloroethane, trichloroethene (TCE), vinyl chloride (VC), and xylenes. In addition, the analysis included PCE which has been detected in Jasco wells.

All analytical data were reviewed; however, only 1,1-DCA, 1,1-DCE, PCE, and VC were found to exceed the ROD-specified cleanup standard for site groundwater at any point in time during the quarterly monitoring within the time period of interest. Consequently, only these four COCs have been graphed and presented in Figures 1 through 5.

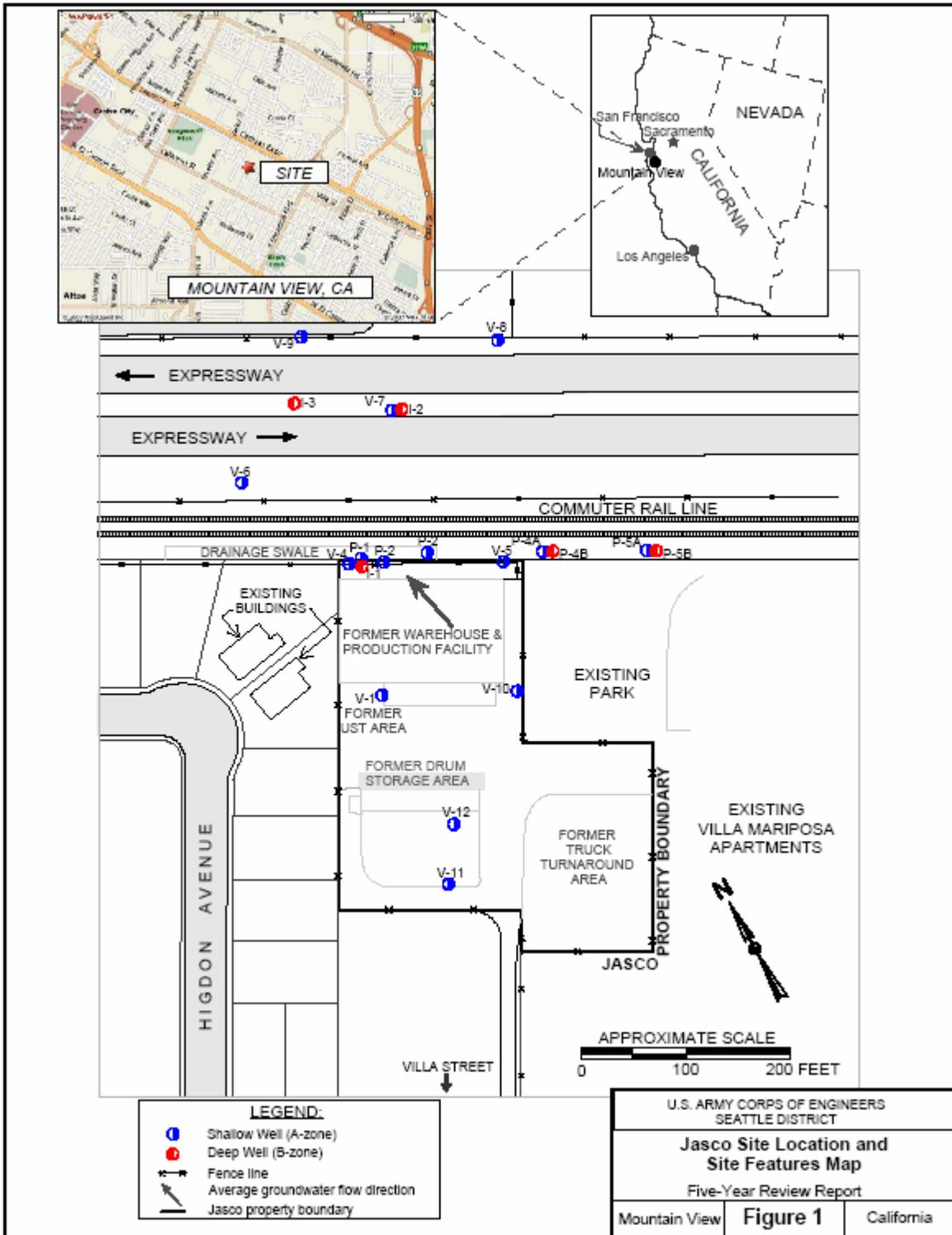
In site soils, methylene chloride and benzene were the only COCs found above cleanup standards after the Remedial Investigation (OHM 1991) (elevated methylene chloride was present in the drainage swale, former UST area, former diesel tank area, and drum storage area, while elevated benzene was found only at the former diesel tank area). The final Remedial Action Report for soil (IT 2002), based on sampling conducted between 1995-1998, concluded soil within all areas of concern at the Jasco facility was not currently contaminated with constituents of concern above the specified cleanup standards. This was after selective soil removal, dual vapor extraction, and UST and associated contaminated soil treatment or removal occurred at the site. The remaining levels of contaminants present in the soil meet the remedial cleanup requirements for this site and therefore are protective of the A-aquifer groundwater.

Handling of Non-Detect and Estimated Concentrations.

For graphical presentation of groundwater data, non-detections were assigned a value of ½ the lowest method detection limit (MDL) for that constituent. Estimated or J-flagged concentrations were assigned the actual estimated value. Use of constant detection limits in the analysis, though not strictly accurate, avoids the introduction of false trends based on non-detectable concentrations. For example, a well with mostly non-detects will therefore yield a “stable” trend based on the analysis, rather than an increasing or decreasing trend based on changes in the MDLs for the samples used in the analysis.

Analytical Data - A-aquifer.

Figure 1 shows the overall Jasco Site Location and Site Features. The first quarterly monitoring dataset showed only one location (well V-4) out of nine total locations to contain 1,1-DCA (Figure 2), 1,1-DCE (Figure 3), and VC (Figure 4) in groundwater above the cleanup standards. The first quarterly monitoring dataset also showed PCE to exceed the cleanup standard limit at three of the nine monitored locations (V-4, V-8, V-9, V-10) as depicted in Figure 5. No other COCs were present in groundwater above cleanup standards at that time. Since January 2002 (Quarter 1), no COCs have been present in groundwater above cleanup standards other than PCE at any location. This includes 18 consecutive quarterly monitoring events up to July 2006 (the last round in which data were available for review). PCE has been consistently above 5 ug/l in well V-8, V-10, and EW-6A (began monitoring in October 2002) and has been relatively stable at V-10 and EW-6A, and has been increasing slightly at V-8 over time (Figure 5). PCE was initially below 5 ug/l at V-9 but has consistently increased such that the concentration has been in excess of 5 ug/l since July 2004 (Figure 5). Well V-4 PCE dropped below 5 ug/l in April 2002 and has remained below 5 ug/l since that time.



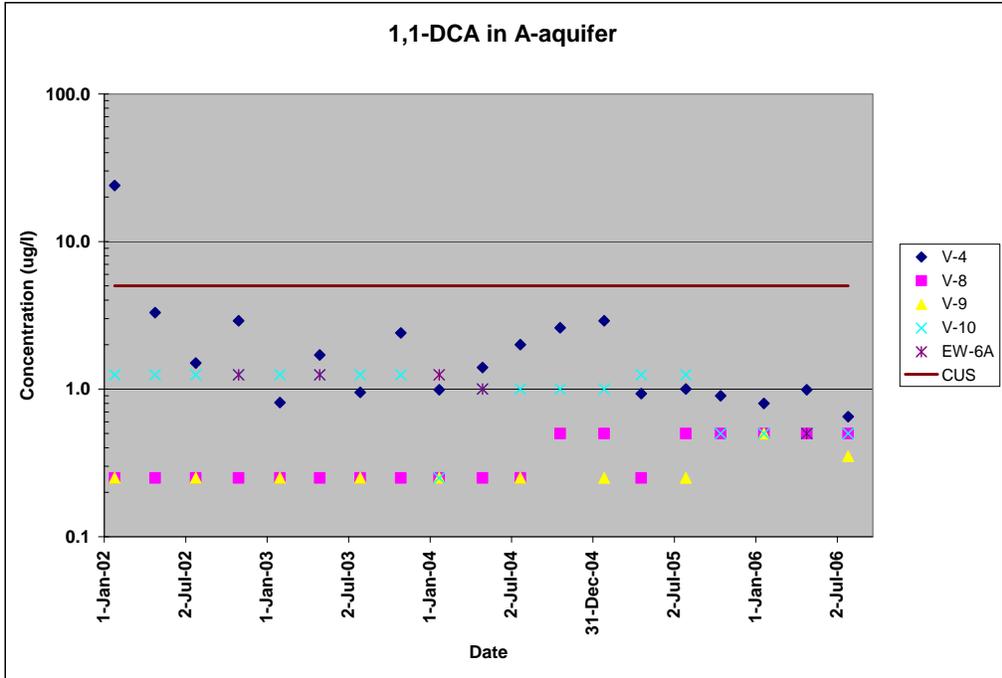


Figure 2. Only site groundwater 1,1-DCA exceedance occurred in Jan 02 at well V-4 with a concentration of 24 ug/l (CUS, the clean up standard, is 5 ug/l). There were no 1,1-DCA exceedances in the B-aquifer.

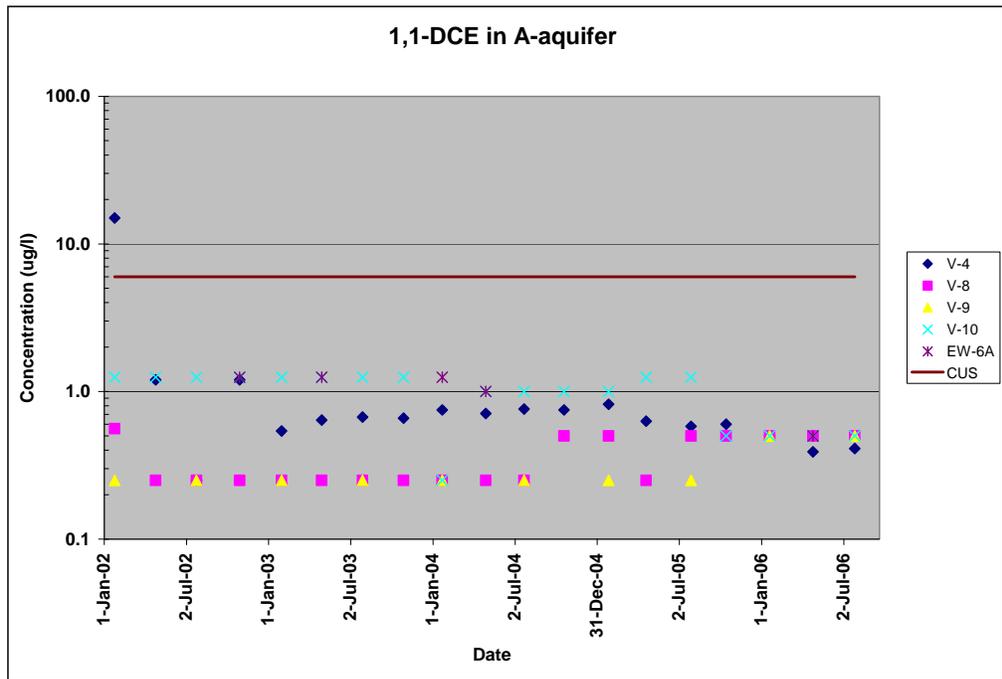


Figure 3. Only site groundwater 1,1-DCE exceedance occurred in Jan 02 at well V-4 with a concentration of 15 ug/l (CUS, the clean up standard, is 6 ug/l). There were no 1,1-DCE exceedances in the B-aquifer.

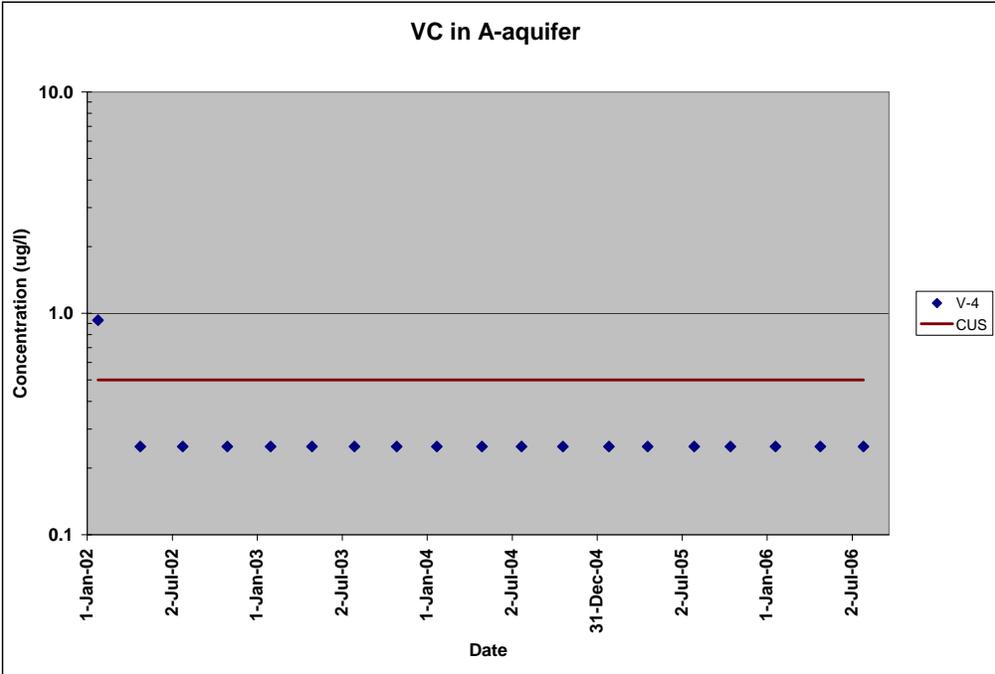


Figure 4. Only site groundwater VC exceedance occurred in Jan 02 at well V-4 with a concentration of 0.93 ug/l (CUS, the clean up standard, is 0.5 ug/l). There were no VC exceedances in the B-aquifer.

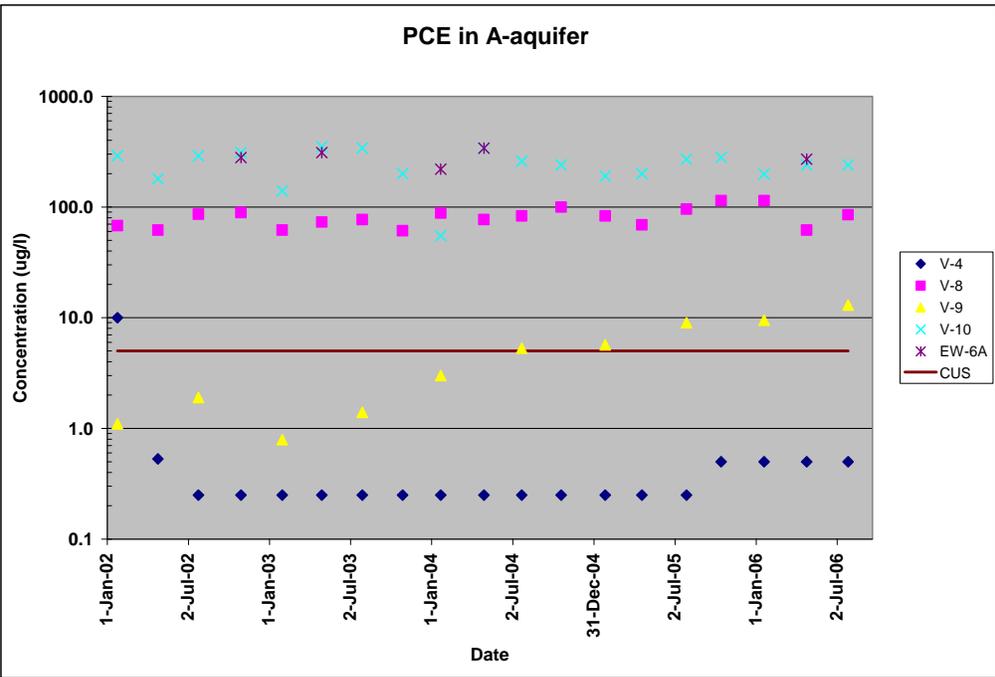


Figure 5. PCE CUS (clean up standard) of 5 ug/l is commonly exceeded at multiple A-aquifer wells; however, the Jasco site was determined not to be the source of this contaminant

The Mann-Kendall non-parametric test for trend was applied to PCE data of A-aquifer wells to determine whether the data indicated increasing, decreasing, or stable trends, or whether trend determinations

could not be made due to excessive data scatter. PCE data from shallow well V-9 indicated a statistically significant increasing trend at the 95 percent confidence interval, while data from shallow well V-8 indicated a significant increasing trend at the 90 percent confidence interval (Table 3). Well V-10 data indicated no trend (i.e., data stability) with low scatter (defined as having a coefficient of variation less than one). Of particular interest is the fact that at well V-9, the farthest A-aquifer downgradient well from the Jasco site and other former industrial properties, the PCE concentrations is increasing at the fastest rate.

Table 3. PCE Trends in Groundwater of the A-aquifer

Well ID	Sample Size (n)	Mann-Kendall Statistic (S)	Trend at 90% Confidence Interval?	Trend at 95% Confidence Interval?
V-8	19	51	Yes, increasing	No
V-9	10	39	Yes, increasing	Yes, increasing
V-10	19	-19	No	No

Analytical Data - B-aquifer.

The only chemical of concern present in B-aquifer groundwater at any time during the monitored period above the cleanup standard was PCE. In fact, with a dataset ranging from 7.3 to 104 ug/l, every data point from all three wells monitored (I-1, I-2, I-3) are in excess of the 5 ug/l limit for PCE. Furthermore, as depicted in Figure 6 and summarized in Table 4, increasing PCE trends at the 95 percent confidence interval using the Mann-Kendall test for trend are evident in all three B-aquifer wells from 2002 to 2006. During the vast majority of that period no groundwater extraction occurred on site since the treatment system was shut off in March 2002 due to lack of COCs other than PCE present in concentrations which exceeded cleanup standards for groundwater. These three B-aquifer wells are all either at the downgradient Jasco property boundary (I-1) or beyond the Jasco and former industrial properties within the median of the Central Expressway (I-2 and I-3).

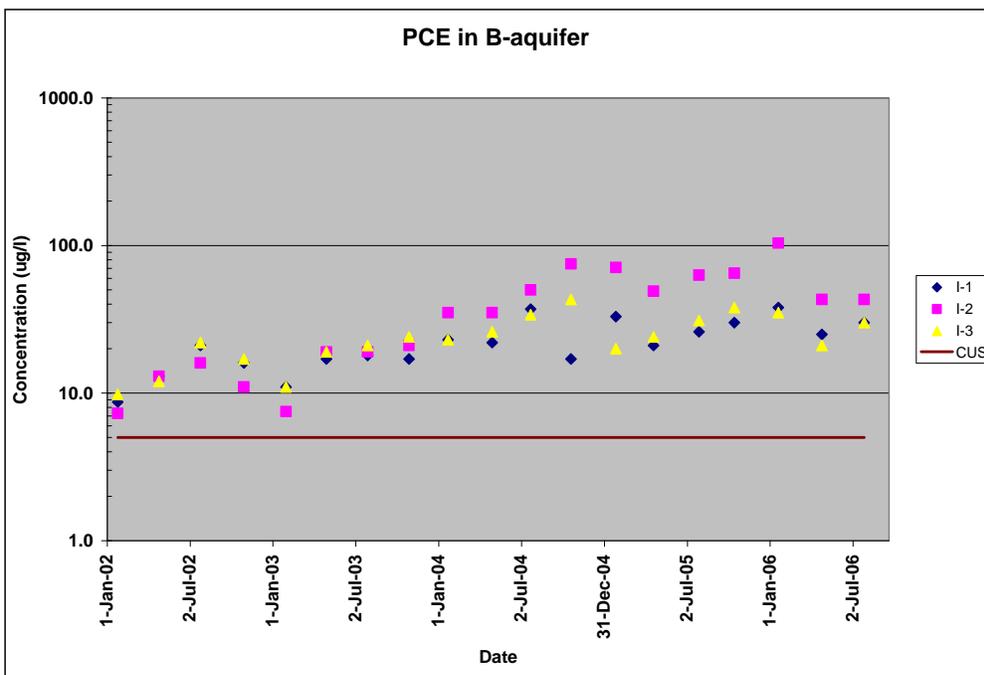


Figure 6. PCE CUS (clean up standard) of 5 ug/l is exceeded at all three B-aquifer monitoring wells

Table 4. PCE Trends in Groundwater of the B-aquifer

Well ID	Sample Size (n)	Mann-Kendall Statistic (S)	Trend at 90% Confidence Interval?	Trend at 95% Confidence Interval?
I-1	19	104	Yes, increasing	Yes, increasing
I-2	19	114	Yes, increasing	Yes, increasing
I-3	19	95	Yes, increasing	Yes, increasing

Hydraulic Data - A-aquifer

Figure 7 shows a consistent, seasonal cyclical pattern in all monitored wells in the A-aquifer groundwater elevations, superimposed on an overall trend of increasing groundwater elevations over the monitored period of 2002-2006. The seasonal cycle includes increasing groundwater elevations in the winter and spring months followed by decreasing elevations in the summer and fall months. This behavior reflects the influence of the Mediterranean climate typical of the San Francisco Bay Area, which consists of pronounced wet and dry seasons with mild wet winters and warm dry summers. Sixty-six percent of precipitation occurs in just the four months of November to February, and nearly 87 percent occurs within the six month period of October to March (WR CDC 2007).

The overall general increasing trend of groundwater elevations from January 2002 to July 2006 in all monitored wells is also readily apparent (Figure 7). For A-aquifer wells, the range of groundwater elevations in January 2002 was about 40 to 44 feet mean sea level (msl), whereas the range had increased to about 44 to 47 feet msl by July 2006. Upon inspection of the historical local precipitation patterns (Figure 8) it is observed that annual precipitation increased each year from 2002-2005, followed by a slight decline between 2005-2006, although the 2006 precipitation (20.4 inches) was still well above the yearly average of about 14.7 inches per year. This increase in precipitation and corresponding aquifer recharge since 2002 is believed to be the direct cause for increases in groundwater elevations over the period in which groundwater data has been collected.

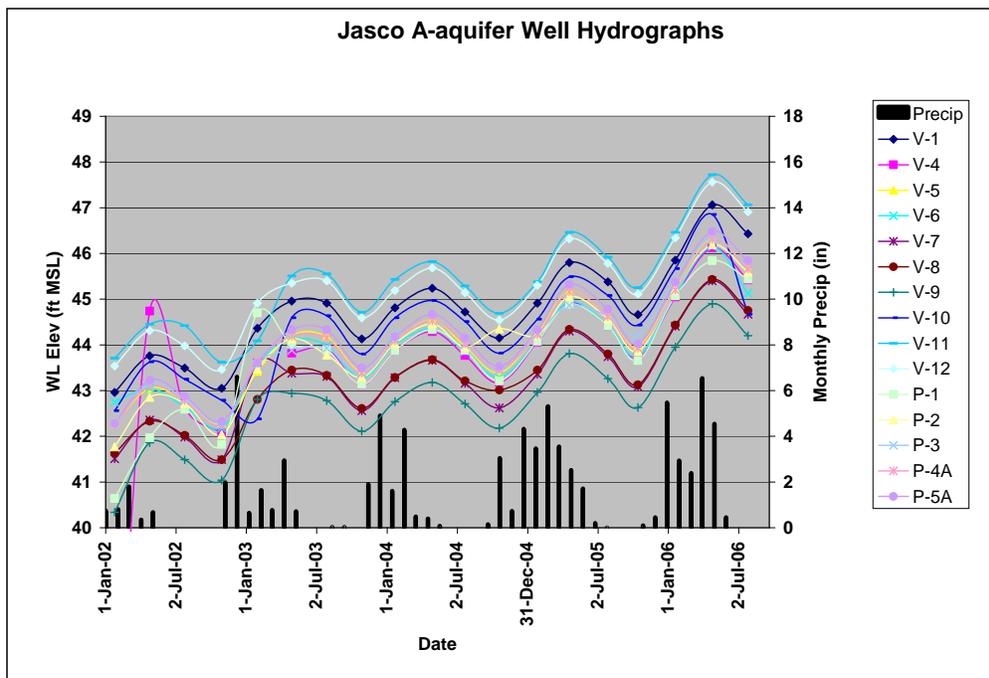


Figure 7. Groundwater elevation in monitored A-aquifer wells and piezometers.

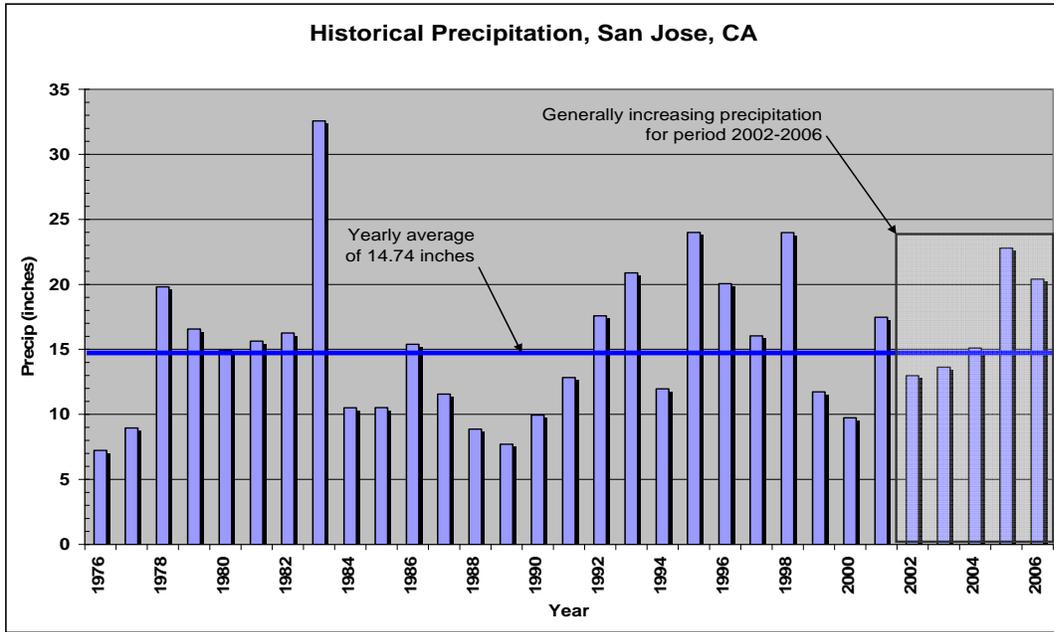


Figure 8. Historical annual precipitation for the San Jose Cooperative Weather Station, located approximately 10 miles from the Jasco site. Drought period of 1987-1991 apparent, as well as increasing precipitation for four of the five years of the five year review dataset (2002-2006).

Hydraulic Data - B-aquifer

Figure 9 shows groundwater elevations of the monitored B-aquifer wells. The seasonal cyclical and general increasing overall trend patterns are both readily apparent in B-aquifer wells as they were in A-aquifer wells. The causes are the same as mentioned previously. Furthermore, since groundwater elevations in the B-aquifer respond so readily to precipitation and are very similar to elevation patterns of the A-aquifer wells, these two aquifers are likely closely interconnected.

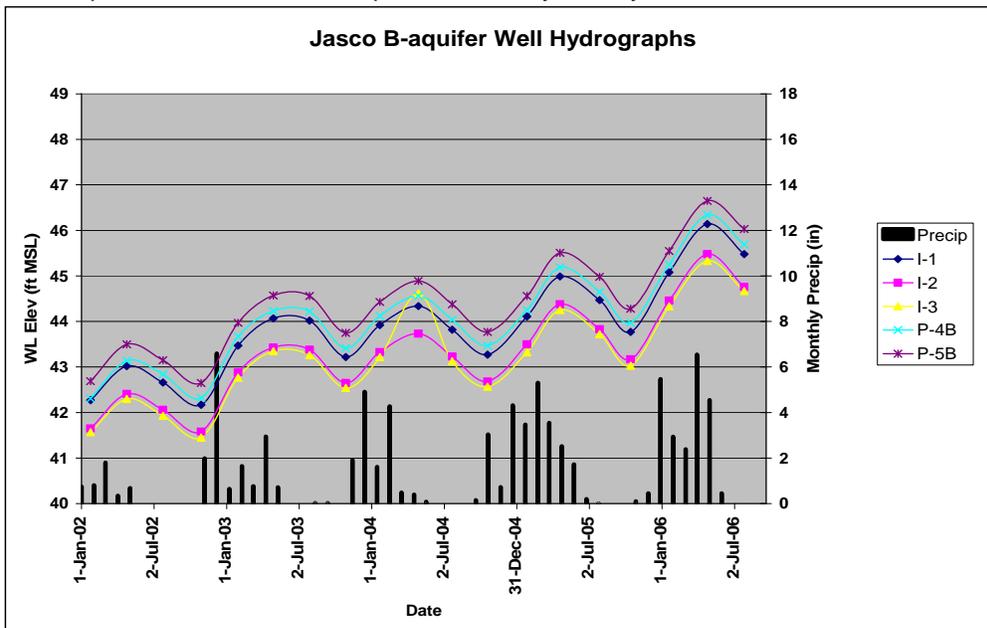


Figure 9. Groundwater elevation in monitored B-aquifer wells and piezometers.

Analysis and Conclusions.

PCE was determined not to be from Jasco operations as per the 2000 PCE report findings and as documented in the ESD. This has significant implications for the groundwater data evaluation because all other Jasco-related COCs have been below the ROD-stated cleanup standards for 18 consecutive quarters (over four years, from April 2002 to July 2006). Furthermore, there appear to be no upward trends for any Jasco-related COCs, which indicates future exceedances of the cleanup standards are unlikely. The ex-situ soil remedial measures taken (contaminated soil removal, and bioremediation of UST area soils) combined with in-situ dual vapor treatment within the drainage swale area, and coupled with groundwater extraction and treatment up to March 2002, appear to have successfully removed COCs in both soil and groundwater at the Jasco site to below the cleanup standards.

The two observed patterns of seasonal cyclical and general increasing trend in groundwater elevation data do not appear to influence contaminant concentrations in any significant way. This is evidenced by very low correlation between the two datasets.

Groundwater gradient direction has historically been to the north-northeast, although more recent data has suggested a potential shift to the north-northwest in both A- and B-aquifers. These directions are consistent with the gentle downward northeasterly slope of the local topography and reported surface water drainage off site to the northeast, and to the northwest to a lesser extent (towards Permanente Creek). The potential shift of gradient direction corresponds with a general increase in water level elevations caused by increased precipitation recharge over the last five years; however, no information exists to confirm whether these events are interconnected. The apparent recent shift in groundwater flow direction may also be attributable to changing patterns of extraction from deeper (C-aquifer) groundwater by the City of Mountain View approximately 2,000 feet northwest of the site; however, this also could not be confirmed. The potential shift in groundwater flow direction has no adverse implications on site because all Jasco-related COCs in groundwater are and have been consistently below cleanup standards. The gradient direction may be of concern for future monitoring and/or remedial action related to PCE in groundwater.

The groundwater extraction and treatment system was shut off and has not been in operation since March 2002. Also, the soil vapor extraction and treatment system to treat drainage swale soil contamination was shut off and has not been in operation since February 1998. Since there was no active treatment system on site in operation during the period of this Five Year Review, no system performance or operation and maintenance data were available for evaluation.

Site Inspection

The site inspection was conducted on April 20, 2007. Attendees included representatives from EPA, USACE, a consultant representing Jasco Chemical Corporation, and the current property owners and their consultant. The review team visually inspected the condition of the site and the surrounding area. Because the groundwater treatment system is no longer operational, no inspection was necessary. See Attachment 6 for the Site Inspection Checklist.

Interviews

No interviews were conducted in conjunction with this review.

VII. Technical Assessment

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

The review of documents, ARARs, risk assumptions and the results of the site inspection indicates that

the remedy is functioning as intended by the ROD and as modified by the ESD. The DVE/SVE system installed initially as a pilot study was successful in treating contaminated soil in the drainage swale area and reducing the potential of continued contaminant migration to groundwater. The groundwater extraction and treatment system has also been successful in treating the COCs to below cleanup standards. This achievement has been confirmed by 18 consecutive quarters of groundwater monitoring data showing concentrations below action levels

The ROD called for institutional controls to prevent the use of groundwater and other activities that may negatively impact contaminant migration until cleanup is complete. Since contaminants associated with Jasco's operations are now below cleanup standards, restrictions to prevent exposure would normally not be required any longer. However, the presence of PCE in groundwater from an off-site source does require institutional controls. These restrictions are defined in the ESD. A search of the Santa Clara County Official Records index and the EnviroStor Database of land use restrictions maintained by the California Department of Toxic Substances Control (DTSC) did not produce a deed restriction. While no site activity was observed that violated the intent of the required institutional controls, the lack of a properly filed deed restriction does not meet the requirements of the ESD.

Question B: Are the exposure assumption, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Changes in ARARS and Standards

Generally, the standards and toxicological values used at the time of remedy selection have remained unchanged with the following exceptions:

- The Record of Decision (ROD) for the Jasco site selected either the State or Federal Maximum Contaminant Levels (MCL) for groundwater cleanup levels, whichever was more stringent. When the ROD was finalized, the State of California did not have promulgated MCLs for pentachlorophenol nor methylene chloride. Since that time, the State has adopted the MCLs for these compounds that are the same as the Federal standard.
- Subsequent to finalization of the ROD, the State lowered the MCL for ethylbenzene from 0.68 mg/L to 0.3 mg/L. Consequently, if the ROD were finalized today, the cleanup level for ethylbenzene in groundwater would be lower.
- The toxicity factor used to estimate the excess cancer risk associated with exposure to trichloroethene has also changed. The value that was used in the original baseline risk assessment has been withdrawn by EPA and a new value has yet to be included in the IRIS database.

The promulgation of the State MCLs does not impact the protectiveness of the selected remedy since the State of California adopted the Federal standard. At the time that the ROD was finalized, the Federal MCLs were the only promulgated standard and became the cleanup standard for the site for pentachlorophenol and methylene chloride. This is significant because the concentrations of methylene chloride in soil and groundwater represented the highest estimated risk to potential receptors identified in the baseline risk assessment. Since the State selected the same standard as the Federal MCL, there is no impact on the protectiveness of the remedy.

The maximum concentration of ethylbenzene measured on the site is a fraction of the new State MCL (0.3 mg/L vs. a max. detection of 0.057 mg/L). Since ethylbenzene does not make a significant contribution to estimated risk at the site, the lowering of the State MCL does not impact the protectiveness of the remedy.

The greatest uncertainty with toxicological changes for the Site is associated with TCE. In August 2001, U.S. EPA's Office of Research and Development (ORD) released the draft "Trichloroethylene Health Risk Assessment: Synthesis and Characterization" ("TCE Health Risk Assessment") for external peer review. According to the draft TCE Health Risk Assessment, for those who have increased susceptibility and/or higher background exposures, TCE could pose a higher risk through inhalation than previously considered. The Science Advisory Board, a team of outside experts convened by U.S. EPA, reviewed the draft TCE Health Risk Assessment in 2002. In July 2006, the National Academy of Sciences completed additional peer review of scientific issues that were the basis for the draft TCE Health Risk Assessment. In response to this review, EPA will revise the draft TCE Health Risk Assessment. Consequently, review of the toxicity value for TCE may continue for a number of years. This issue will need to be updated in subsequent Five-Year Reviews. However, trichloroethene was rarely detected in site groundwater and contributed little to the estimated risk of the Jasco site. Consequently, the change in the toxicity factor for trichloroethene appears to have little impact on the original baseline risk assessment and on the protectiveness of the remedy.

Changes in Exposure Pathways

The ROD and baseline risk assessment for the Jasco site described current and future land uses accurately and identified likely exposure pathways. The risk assessment evaluated current and future health risks associated with exposure to soil (dermal absorption and incidental ingestion) and groundwater (ingestion, inhalation and dermal absorption). Exposure to contaminated vapors and inhalation of contaminated dust particles was evaluated only in terms of potential soil disturbance. Recently, EPA's understanding of contaminant migration from groundwater into buildings has indicated that vapor intrusion may have a greater potential for posing risk to human health than originally assumed at the time the ROD was prepared. In September 2002, EPA released an external review draft version of its vapor intrusion guidance titled "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (EPA 2002). Given the successful soil removal activity (source control) and low groundwater concentrations, it is unlikely that the vapor intrusion pathway is complete for any of the contaminants released at the Jasco site.

There does appear to be potential for an off-site source of PCE groundwater contamination to impact site groundwater. The risk of possible vapor intrusion to workers and future residents of the site was evaluated by the City of Mountain View in January 2003. The vapor pathway risk assessment concluded that the estimated excess cancer risk to potential future residents was in the range of 4.2×10^{-7} to 2.1×10^{-9} , depending on the exposure assumptions and parameters. (This risk level is considerably lower than the range EPA considers acceptable, i.e., 1×10^{-4} and 1×10^{-6} .) The risk to construction workers involved in excavation activity was estimated to range between 9.9×10^{-9} and 4.2×10^{-9} . EPA Region 9 has reviewed the risk assessment and future sampling may be required. While vapor intrusion appears unlikely to impact the current protectiveness of the remedy, it may be prudent to evaluate this pathway more completely if the site were to be re-developed for residential use.

Changes in Toxicity Values

There have been a number of changes to the toxicity values for certain contaminants of concern at the Site. Revisions to the toxicity values for 1,1-DCE and vinyl chloride indicate a lower risk from exposure to these chemicals than previously considered. On the other hand, evaluation of the toxicity value for PCE is ongoing, and may indicate higher risks from exposure than previously considered.

Changes in Site Conditions

The most obvious physical changes at the site have been the removal of structures and equipment associated with the former operations of the Jasco Chemical Company. The site now appears to be a fenced, grassy field. Since contaminated soil has been removed, the physical and chemical risks

associated by the site appear to have been reduced and potential exposure pathways have been controlled.

With the exception noted above, there are only limited changes in land use, toxicity factors and exposure pathways that would impact the risk associated with the site and the protectiveness of the remedy. The greatest uncertainty is associated with the potential exposure to PCE in indoor air transported in groundwater from an apparent off-site source.

Question C; Has any other information come to light that could call into question the protectiveness of the remedy?

No ecological receptors were identified during the baseline risk assessment and none were identified during the five-year review. Therefore, monitoring of ecological receptors is not necessary. Soil and groundwater sampling have confirmed that all cleanup standards for the site have been achieved. No weather-related events have affected the protectiveness of the remedy. However, movement of the PCE contaminated plume onto the Jasco property prevents unrestricted use. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD and as modified by the ESD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs for soil and groundwater contamination cited in the ROD have been met. There have been only minor changes to toxicity factors for the contaminants of concern that were used in the baseline risk assessment. There have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. Issues

Table 5: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
The Section 1471 Environmental Restriction (deed restriction) has not been recorded in the County Clerk's Official Records index.	N	Y
PCE contaminated groundwater has migrated onto the site from an off-site source.	N	N
Current analysis for vapor intrusion relies on groundwater data; soil gas samples would verify conclusions of risk assessment	N	N

IX. Recommendations and Follow-up Actions

Table 6: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Deed restrictions	Ensure that the appropriate deed restriction has been recorded with the County Clerk's office.	Harry M. & Carol Jean Anthony	EPA	3/31/2008	N	Y
PCE in groundwater	Work with State and other interested parties to investigate extent of plume	EPA	RWQCB/DTSC / EPA	9/30/2008	N	N
PCE Vapor Intrusion	Sample soil gas near residences to confirm no risk from vapor intrusion	EPA	EPA	9/30/2008	N	N

X. Protectiveness Statement

The overall remedy at the Jasco Chemical Superfund Site for both soil and groundwater is considered protective in the short-term of human health and the environment since there is no evidence of a complete exposure pathway. The remedy is expected to continue to be protective for the foreseeable future. The Institutional Control needs to be recorded with Santa Clara County and must remain in place until the off-site PCE plume is delineated and addressed

XI. Next Review

The next five-year review for the Jasco Chemical Company Superfund Site is required by September 2012, five years from the date of this review.

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Attachment 1

Site Maps

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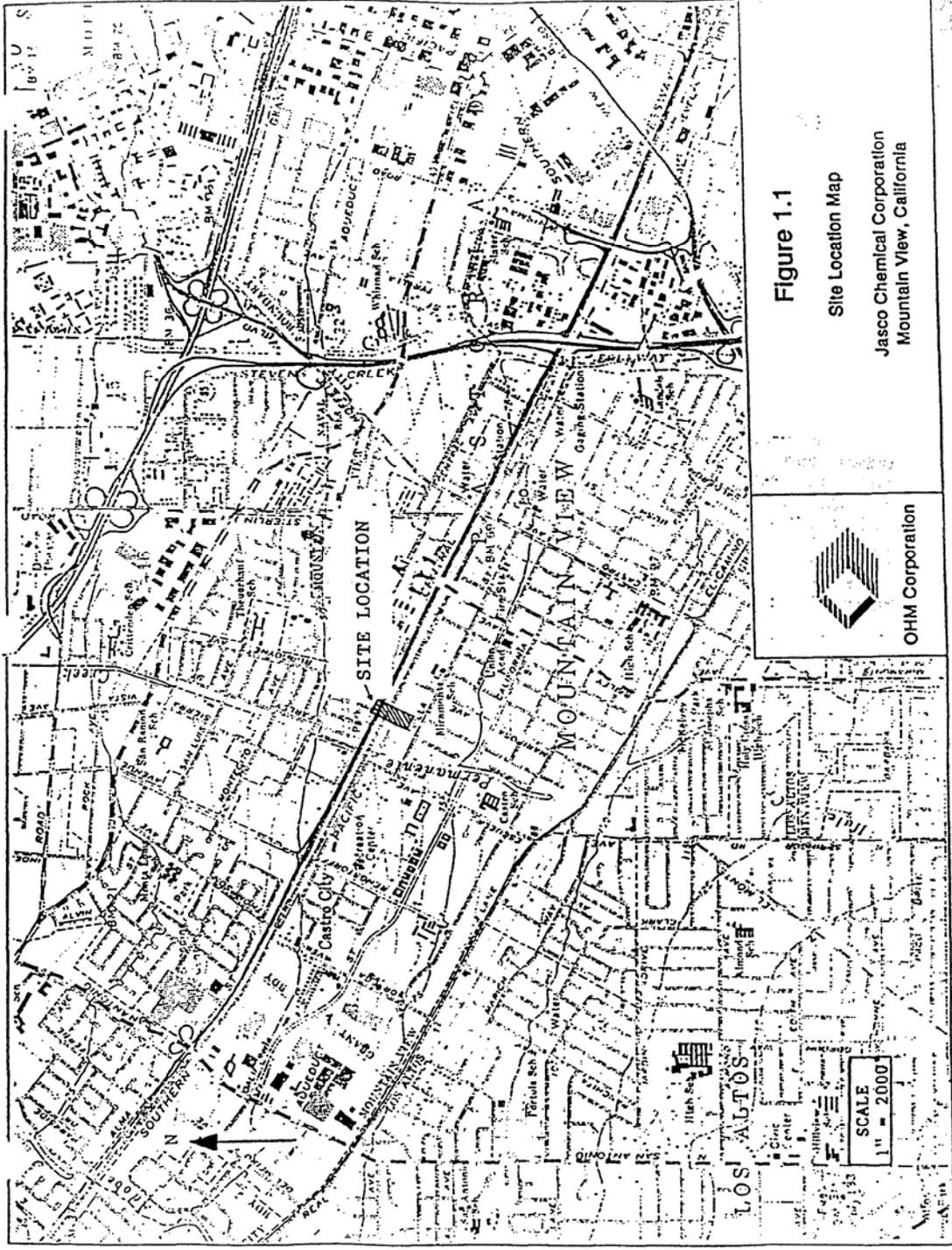


Figure 1.1

Site Location Map

Jasco Chemical Corporation
Mountain View, California



OHM Corporation

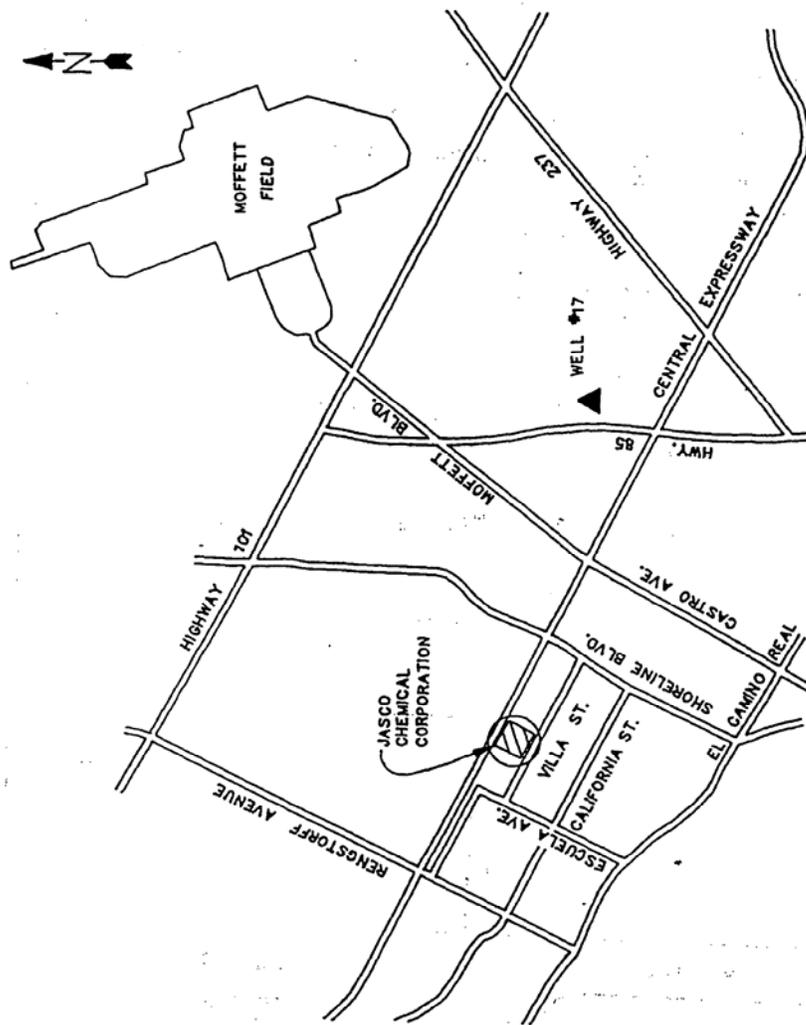
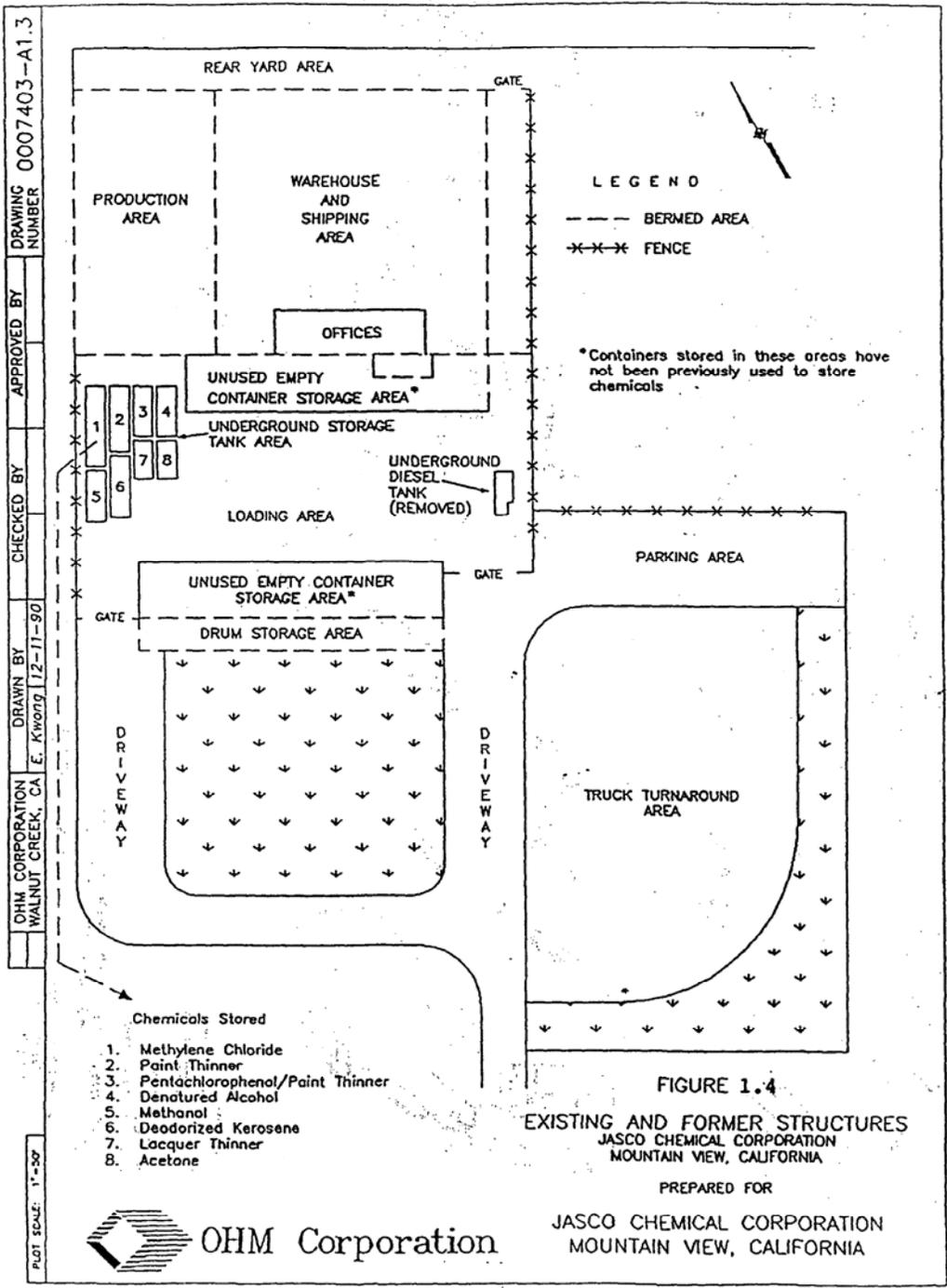


FIGURE 1.2
JASCO LOCATION MAP

 SITE



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Attachment 2

List of Documents Reviewed

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ATTACHEMENT 2

List of Documents Reviewed

Jasco Chemical Company Superfund Site Record of Decision, September 30, 1992.

Explanation of Significant Difference to the 1992 Record of Decision, Jasco Chemical Company Superfund Site, September 13, 2002.

Jasco Chemical Corporation, Revised PCE Investigation Report. Prepared by IT Corporation (Dec 2000).

Field Audit Report of Soil Sampling, Conducted by Andrew Lincoff, U.S. EPA Region 9 Laboratory (Mar 2002).

Release of Need to Sample Under Office Building and Canopy Memo, EPA Region 9 to Jasco Chemical Company (Mar 2002).

Jasco Chemical Corporation, Revised Final Remedial Action Report for Soil. Prepared by IT Corporation (July 2002).

Jasco Chemical Corporation, 2001 Annual Self-Monitoring Report for Groundwater Extraction/Treatment (Jan 2002).

Jasco Chemical Corporation, 2002 Annual Self-Monitoring Report for Groundwater Extraction/Treatment (Jan 2003).

Results of Groundwater Monitoring Program and Quarterly Progress Reports (covering quarterly events Jan 2002, Apr 2002, Jul 2002, Oct 2002, Jan 2003, Apr 2003, Jul 2003, Oct 2003, Jan 2004, Apr 2004, Jul 2004, Oct 2004, Jan 2005, Apr 2005, Jul 2005, Oct 2005, Jan 2006, Apr 2006, Jul 2006)

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Attachment 3
Draft ARAR Memo

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MEMORANDUM FOR RECORD

SUBJECT: ARAR Analysis, Jasco Chemical Company Superfund Site, Five Year Review

PREPARED BY: Travis Shaw, Environmental Scientist, Seattle District, U.S. Army Corps of Engineers

Date: 9 March 2007

Seattle District, U.S. Army Corps of Engineers is assisting the U.S. Environmental Protection Agency, Region 9, with the completion of statutorily required Five Year Reviews. As requested by EPA, one of the steps in evaluating the protectiveness of an implemented remedy is a review of the applicable or relevant and appropriate requirements (ARARs) for federal, state, or local regulations related to human health or the environment. The goal of the ARAR review is to determine if changes in the ARARs identified in the ROD impact the protectiveness of the remedy. This memorandum is the ARAR evaluation for the Jasco Chemical Company Superfund Site Five Year Review.

The majority of chemical specific ARARs have remained unchanged from the date of the original ROD with the following exceptions. At the time the original ROD was finalized (September 30, 1992), the State of California did not have promulgated Maximum Contaminant Levels (MCLs) for Pentachlorophenol nor Methylene chloride. Since that time, the State has adopted MCLs for these compounds that are the same as the Federal standard. In addition, the State MCL for Ethylbenzene was lowered from 0.68 mg/l to 0.3 mg/l. The cleanup goal for the site, as described in the ROD, is the more stringent federal or state drinking water standard. At the time that the ROD was signed, the State standard was slightly more stringent at 0.68 mg/L than the Federal standard of 0.7 mg/L. If the ROD were finalized today, the cleanup goal for Ethylbenzene would be 0.3 mg/l rather than 0.68 mg/l. The impact of the change on the protectiveness question will be addressed in the evaluation of risk assessment and toxicological issues.

An additional ARAR change required a modification of ROD in the form of an Explanation of Significant Difference (ESD). As described by the ROD, the remedy allowed the discharge of treated groundwater to a POTW under an existing NPDES permit. Subsequent to implementation of the remedy, municipal authorities chose not to renew the existing discharge permit. Consequently, treated groundwater was rerouted and discharges to a surface water body. However, the Regional Water Quality Control Board (RWQCB), which became the new regulating authority forbid discharge of treated groundwater at concentrations above the MCL. As a result, the treatment system was modified to use both activated carbon and an air stripper to meet these more stringent discharge requirements. The change in discharge requirements was regulated under the Clean Water Act, which was not listed as an ARAR in the ROD, but was correctly identified as an ARAR in the ESD signed on September 13, 2002.

Contaminant Specific ARARs	Citation	Standard Applied in ROD	Standard Applied in ESD	Current Standard
Federal Drinking Water Standards	Section 1412 of the Safe Drinking Water Act (SDWA), 42 U.S.C. 300g-1, “National Drinking Water Regulations”; National Primary Drinking Water Regulations. 40 CFR Part 141	Federal or State MCL, whichever is most stringent.	Federal or State MCL, whichever is most stringent.	Federal standards are unchanged from the date the ROD was finalized.
State Drinking Water Standards	California Safe Drinking Water Act, Health and Safety Code, Div. 5, Part 1, Chapter 7, 4010 et. seq., California Domestic Water Quality Monitoring Regulations, CAC Title 22, Division 4, Chapter 15, 64401 et seq.	Federal or State MCL, whichever is most stringent.	Federal or State MCL, whichever is most stringent.	State standards for Methylene chloride and Pentachlorophenol promulgated. State MCL for Ethylbenzene lowered from 0.68 mg/l to 0.3 mg/l.
Action Specific ARARs	Citation	Standard Applied in ROD	Standard Applied in ESD	Current Standard
Treatment by Liquid Phase Carbon Absorption	Solid Waste Disposal Act, as amended by Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq.	Use of granular activated carbon for remediation of VOCs triggers requirements associated with regeneration or		

		disposal, storage, and handling of spent carbon.		
Handling and Storage of Hazardous Waste	RCRA and Hazardous Solid Waste Amendment (HSWA) Standards (42 U.S.C. 6901-6987)	Remedial activities involving excavation of removal of hazardous wastes, on-site management of hazardous wastes or removal to off site facilities must be in compliance Federal and State regulations.		
	California Hazardous Waste Control Laws (Health and Safety Code, Div. 20, Chapter 6.5, Articles 2,4,4.5, 5,6,6.5 and 7.7	State of California standards governing hazardous waste control, management of hazardous waste facilities, transportation of hazardous waster and classification of hazardous waste.		
Underground Storage Tank Requirements	California Health and Safety Section 25280 et seq. and 23 CCR Sections 2670-2672	State regulations governing underground storage tank monitoring, repairs, releases and closures.		
Air Emissions	Clean Air Act, 42 U.S.C. 7401	Regulates air emissions to		

	et seq. and Bay Area Air Quality Management District Regulation 8, Rule 5, 40 and 47.	protect human health and the environment associated with the storage of organic liquids, aeration of contaminated soil, removal of underground storage tanks, air stripping and groundwater aeration.		
Liquid discharges	Clean Water Act (CWA) Section 402 NPDES Requirements	Not identified in the ROD.	Governs discharge of treated groundwater. More stringent requirements required treatment to MCLs prior to discharge to surface water.	No change from date of the ESD.

Attachment 4

Draft Risk Assessment Memo

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MEMORANDUM FOR RECORD

SUBJECT: Draft Risk Assessment and Toxicology Analysis Memorandum, Jasco Chemical Company Superfund Site, Five Year Review

PREPARED BY: Travis Shaw, Environmental Scientist, Seattle District, U.S. Army Corps of Engineers

Date: September 9, 2007

Seattle District, U.S. Army Corps of Engineers is assisting the U.S. Environmental Protection Agency, Region 9, with the completion of statutorily required Five Year Reviews. As requested by EPA, one of the steps in evaluating the protectiveness of an implemented remedy is a review of the assumptions and toxicological standards used at the time of the remedy selection. The goal of the risk assessment and toxicology review is to determine if changes in the assumption or standards identified in the ROD impact the protectiveness of the remedy. This memorandum is the risk assessment and toxicology evaluation for the Jasco Chemical Company Superfund Site Five Year Review.

Changes in ARARS and Standards

Generally, the standards and toxicological values used at the time of remedy selection have remained unchanged with the following exceptions:

- The Record of Decision (ROD) for the Jasco site selected either the State or Federal Maximum Contaminant Levels (MCL) for groundwater cleanup levels, whichever is more stringent. When the ROD was finalized, the State of California did not have promulgated MCLs for pentachlorophenol nor methylene chloride. Since that time, the State has adopted the MCLs for these compounds that are the same as the Federal standard.
- Subsequent to finalization of the ROD, the State lowered the MCL for ethylbenzene from 0.68 mg/L to 0.3 mg/L. Consequently, if the ROD were finalized today, the cleanup level for ethylbenzene in groundwater would be lower.
- The toxicity factor used to estimate the excess cancer risk associated with exposure to trichloroethene has also changed. The value that was probably used in the original baseline risk assessment has been withdrawn by EPA and a new value has yet to be included in the IRIS database.

The promulgation of the State MCLs does not impact the protectiveness of the selected remedy since the State of California adopted the Federal standard. At the time that the ROD was finalized, the Federal MCLs were the only promulgated standard and became the clean level for the site for pentachlorophenol and methylene chloride. This is significant because the concentrations of methylene chloride in soil and groundwater represented highest estimated risk

to potential receptors identified in the baseline risk assessment. Had the State selected a lower value, the underlying assumptions of the lower value would need to be evaluated to evaluate whether the remedy remained protective.

The lowering of the State MCL for ethylbenzene could have initiated this kind of evaluation. If the lower State standard was based on new toxicity information that created uncertainty regarding the protectiveness of the Federal standard, then a more complete evaluation may be necessary. In the case of the Jasco site, the maximum concentration of ethylbenzene measured on the site is a fraction of the new State MCL (0.3 mg/L vs. a max. detection of 0.057 mg/L). Since ethylbenzene does not make a significant contribution to estimated risk at the site, the lowering of the State MCL does not appear to impact the protectiveness of the remedy.

The greatest uncertainty with toxicological changes for the Site is associated with TCE. In August 2001, U.S. EPA's Office of Research and Development (ORD) released the draft "Trichloroethylene Health Risk Assessment: Synthesis and Characterization" ("TCE Health Risk Assessment") for external peer review. According to the draft TCE Health Risk Assessment, for those who have increased susceptibility and/or higher background exposures, TCE could pose a higher risk through inhalation than previously considered. The Science Advisory Board, a team of outside experts convened by U.S. EPA, reviewed the draft TCE Health Risk Assessment in 2002. In July 2006, the National Academy of Sciences completed additional peer review of scientific issues that were the basis for the draft TCE Health Risk Assessment. In response to this review, EPA will revise the draft TCE Health Risk Assessment. Consequently, review of the toxicity value for TCE may continue for a number of years. This issue will need to be updated in subsequent Five-Year Reviews. However, trichloroethene was rarely detected in site groundwater and contributed little to the estimated risk of the Jasco site. Consequently, the change in the toxicity factor for trichloroethene appears to have little impact on the original baseline risk assessment and on the protectiveness of the remedy.

Exposure Pathways

The ROD and baseline risk assessment for the Jasco site described current and future land uses accurately and identified likely exposure pathways. The risk assessment evaluated current and future health risks associated with exposure to soil (dermal absorption and incidental ingestion) and groundwater (ingestion, inhalation and dermal absorption). Exposure to contaminated vapors and inhalation of contaminated dust particles was evaluated only in terms of potential soil disturbance. Recently, EPA's understanding of contaminant migration from groundwater into buildings has indicated that vapor intrusion may have a greater potential for posing risk to human health than originally assumed at the time the ROD was prepared. In September 2002, EPA released an external review draft version of its vapor intrusion guidance titled "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (EPA 2002). Given the successful soil removal activity (source control) and low groundwater concentrations, it is unlikely that the vapor intrusion pathway is complete for any on the contaminants released at the Jasco site.

There does appear to be potential for an off-site source of PCE groundwater contamination to impact site groundwater. The risk of possible vapor intrusion to workers and future residents of the site was evaluated by the City of Mountain View in January 2003. The vapor pathway risk assessment concluded that the estimate excess cancer risk to potential future residents was in the range of 4.2×10^{-7} to 2.1×10^{-9} depending on the exposure assumptions and parameters. The risk to construction workers involved in excavation activity was estimated to range between 9.9×10^{-9} and 4.2×10^{-9} . EPA Region 9 has reviewed the risk assessment and there is the possibility that future sampling may be required. While vapor intrusion appears unlikely to impact the current protectiveness of the remedy, it may be prudent to evaluate this pathway more completely if the site were to be re-developed for residential use.

Changes in Site Conditions

The most obvious physical changes at the site have been the removal of structures and equipment associated with the former operations of the Jaccs Chemical Corporation. The site now appears to be a fenced, grassy field. Since contaminated soil has been removed, the physical and chemical risks associated by the site appear to have been reduced and potential exposure pathways have been controlled.

With the exception noted above, there are only limited changes in land use, toxicity factors and exposure pathways that would impact the risk associated with the site and the protectiveness of the remedy. The greatest uncertainty is associated with the potential exposure to PCE in indoor air transported in groundwater from an apparent off-site source.

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Attachment 5
Site Inspection Checklist

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IV. O&M COSTS not applicable
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A
A. Fencing
1. Fencing damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remarks <u>Site appeared secure, though some evidence of trespass (beer bottles, etc.), and fence stepped down on northern edge, however the remedy is complete so there is no risk to damage of the implemented remedy.</u>
B. Other Access Restrictions
1. Signs and other security measures <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A Remarks _____
C. Institutional Controls (ICs)
1. Implementation and enforcement Site conditions imply ICs not properly implemented <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A Site conditions imply ICs not being fully enforced <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A Other problems or suggestions: <u>Institutional controls have not been recorded. However, there are no construction activities onsite, so the restrictions have not been violated; the ICs must be recorded with the county prior to any reuse of the site.</u>
D. General
1. Vandalism/trespassing <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No vandalism evident Remarks <u>There is evidence of trespassing, though there is no treatment system to damage or put at risk.</u>
2. Land use changes on site <input type="checkbox"/> N/A Remarks <u>No land use changes observed. The lot is still vacant.</u>
3. Land use changes off site <input type="checkbox"/> N/A Remarks <u>None observed</u>
VI. GENERAL SITE CONDITIONS
A. Roads <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
VII. LANDFILL COVERS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A

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Appendix

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September 24, 2007

Mr. Rusty Harris-Bishop
Superfund Remedial Project Manager
EPA, Region IX
75 Hawthorne Street, SFD-7-2
San Francisco, CA 94105

Re: First Five-Year Review Report for Jasco Chemical Company, Mountain View, Santa Clara County, California, September 2007

Dear Mr. Harris-Bishop:

On behalf of Max and Carol Anthony, I am providing the attached comments regarding the document referenced above. We request that the comments be incorporated into a revised version of the Five-Year Review Report or included as an appendix to the document.

If you have any questions concerning these comments, or any other issues pertaining to the site with respect to Max and Carol Anthony, feel free to contact me at 916.679.2095

Sincerely,

A handwritten signature in blue ink that reads "Scott Rice".

Scott Rice
Senior Project Manager

SR

Attachment:

cc: Max and Carol Anthony, Mountain View, CA

Comments from Max and Carol Anthony, property owners, and Scott Rice, URS Corporation, consultant to property owners concerning: *First Five-Year Review Report for Jasco Chemical Company, Mountain View, Santa Clara, County, California, September, 2007*

General. The proper name for the business is Jasco Chemical Corporation.

Page 10, Five Year Review Summary Form, Issues subsection 2nd paragraph. Request correcting error in second clause, replacing "soild" with "soil."

Page 13, Section III, Land and Resource Use subsection, 1st paragraph, 2nd sentence. The Pacific Press Publishing Association occupied a large portion of the area to the east of the Jasco Chemical Corporation property, but not the Jasco property itself. Jasco began operations at the site in 1976. From 1954 to 1975, this property was occupied by West Coast Doors, Inc. Another industrial facility, Peninsula Tube Bending, was also present immediately east of the Jasco property.

Page 13, Section III, Land and Resource Use subsection, 1st paragraph, final sentence. The purpose of the extension to December 1995 was to permit Jasco additional time to make preparations for moving its operations to another facility.

Page 13, Section III, History of Contamination, 1st paragraph, 1st sentence. Recommend revising "proprietary products such as degreasers and paint thinners" to "proprietary products such as paint removers, cleaners and thinners" since there was only a small amount of degreaser products produced, and paint thinner wasn't a proprietary product.

Page 14, Section III, Basis for Taking Action subsection. The list of contaminants is introduced with a statement that the substances have been released at the site. We recommend stating that these substances have been detected at the site in recognition that some of the contaminants may have been released elsewhere and migrated onto the site.

Page 15, Bullet Item 2. Recommend revision of 2nd sentence to state that "EPA approved a reduced groundwater monitoring program two years after confirmation that soil cleanup standards had been met." The current program is not tri-annual, but rather includes quarterly sampling for a limited number of wells and analytes with semi-annual or annual sampling of the remaining wells.

Page 16, Section IV, Additional Site Investigations associated with PCE contamination subsection, 1st paragraph. Request correction of error in 2nd sentence; well V-10 is at the former eastern property boundary of Jasco, not the westernmost. Request clarification in 3rd sentence that PCE was not detected in any soil samples collected on the Jasco property prior to the PCE investigation beginning in 1997 and that the detections during the PCE investigation were limited to water bearing zones suggesting lateral migration in groundwater.

Comments from Max and Carol Anthony, property owners, and Scott Rice, URS Corporation, consultant to property owners concerning: *First Five-Year Review Report for Jasco Chemical Company, Mountain View, Santa Clara, County, California, September, 2007 (cont.)*

Page 17, Section IV, System Operation/Operations and Maintenance subsection, 1st sentence.

Recommend clarifying that the groundwater treatment system was shut down in March 2002 to facilitate facility demolition and has not been in operation as groundwater concentrations have remained below maximum contaminant levels other than PCE since that time.

Page 17, Section IV, System Operation/Operations and Maintenance subsection, 2nd sentence.

Recommend clarifying that the soil vapor extraction system was shut down after confirmation soil sampling indicated that levels of target constituents in site soils were below EPA-selected cleanup standards.

Page 20, Section VI, Analytical Data – A-aquifer subsection, 1st paragraph, 3rd sentence. As stated, PCE was detected above cleanup standard in 3 wells during the first quarterly monitoring data set. Request revising list in parenthesis to eliminate reference to well V-9, which did not contain PCE during the initial quarterly monitoring event during this five year period.

Page 24, 1st paragraph, final sentence. While V-9 appears to have the most significant increasing trend, the concentrations are an order of magnitude lower than those near the areas to the east of the Jasco site where maximum PCE concentrations have been detected. In addition, while V-9 is further from the area of highest PCE detection in groundwater, it is cross gradient from V-8 with respect to historic groundwater flow patterns. V-9 appears to be located at the western boundary of the primary plume of PCE contamination and may be subject to greater variation in relative concentrations resulting from lateral migration from the east.

Page 31, Section VIII, Table 5. Recommend correcting error in last row, changing “soild gas samples” to “soil gas samples.”