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2. EPA Remedial Investigation Activities

The ***remedial investigation*** (RI) activities conducted by the United States Environmental Protection Agency (EPA) for the San Gabriel Valley Area 3 ***Superfund*** Site (Area 3) include fieldwork and data collection in two phases, and community outreach activities supported by the subtasks listed below.

- Development of a hydrogeologic ***conceptual site model***, designated as RI Subtask 1
- Assessment of regional ***groundwater contamination*** distribution and identification of ***contaminant*** sources, designated as RI Subtask 2
- Development of a contamination migration conceptual site model, designated as RI Subtask 3
- Assessment of risks to human health and the environment posed by potential exposures to contaminated groundwater, designated as RI Subtasks 4 and 5
- Assessment of the next steps for Area 3 based on the outputs of RI Subtasks 1 through 5, designated as RI Subtask 6, which includes the development of a ***feasibility study***

This section describes the activities undertaken by EPA to generate ***primary data*** and to obtain ***secondary data***. Approximately 60 percent of the data set for the RI consists of secondary data generated by other sources. Sections 3 through 8 of this report present, evaluate, and interpret the results of the RI.

Each section of this report provides a discussion of the subject, followed by any tables or figures cited in the text. In addition, exhibits and text boxes noted in the margins present key concepts, tables, and figures.

*The glossary explains words presented in **bold, italicized** text.*

2.1 Data Evaluation and Planning

Prior to the RI, data revealed the types of ***contaminants of potential concern*** (COPCs) present in ***aquifers*** underlying Area 3, but not the depths at which contamination had adversely impacted groundwater. All groundwater data came from testing performed at public drinking water supply wells, which are designed to efficiently extract groundwater rather than to support collection of data to evaluate groundwater contamination within an aquifer.

The discussion below summarizes the goals of the RI activities for Area 3. Exhibit 2-1 summarizes (1) the planning and reporting documents, and (2) the data evaluation documents developed during RI activities; copies of these documents are provided in Appendices A and B, respectively. Section 2.5 discusses specific field activities and analytical testing in greater detail.

Exhibit 2-1 summarizes the planning and reporting documents for Area 3.

Appendix A provides the planning documents for the RI activities.

Appendix B provides the reporting and data set documents for the RI activities.

EXHIBIT 2-1
Remedial Investigation Planning and Reporting Documents for San Gabriel Valley Area 3 Superfund Site

Planning Documents (provided in Appendix A)	Reporting and Data Set Documents (provided in Appendix B)
• Field Sampling Plan for San Gabriel Valley NPL Area 3 Remedial Investigation Field Activities (FSP) (EPA, 2003a)	• Alhambra Operable Unit Draft Data Evaluation Report (EPA, 2001a)
• Quality Assurance Project Plan for San Gabriel Valley NPL Area 3 Remedial Investigation Field Activities (QAPP) (EPA, 2003b)	• Well Installation Report for San Gabriel Valley NPL Area 3 (EPA, 2003c)
• Field Sampling Plan Addendum No. 1 for San Gabriel Valley NPL Area 3 Remedial Investigation Field Activities (EPA, 2004a)	• Technical Memorandum – San Gabriel Valley NPL Area 3 Well Installation Report – Supplemental Information (CH2M HILL, 2004)
• Quality Assurance Project Plan Addendum No. 1 for San Gabriel Valley NPL Area 3 Remedial Investigation Field Activities (EPA, 2004b)	• San Gabriel Valley NPL Area 3 Data Needs Memorandum (EPA, 2004c)
• San Gabriel Valley Area 3 Superfund Site Community Involvement Plan (EPA, 2004d)	• Interim Guidance for Investigating Potential 1,2,3-Trichloropropane Sources in San Gabriel Valley Area 3 (EPA, 2005a)
• Technical Memorandum – San Gabriel Valley Area 3 Primary Data Quality and Usability Assessment Plan (CH2M HILL, 2006a)	• Well Installation Report (EPAMW16, EPAMW17, and EPAMW18) for San Gabriel Valley NPL Area 3 (EPA, 2006b)
• Technical Memorandum – Secondary Data Assessment and Evaluation Plan, San Gabriel Valley Area 3 (CH2M HILL, 2006b)	• Recommendations for Investigating Volatile Organic Contamination in Soil Vapor San Gabriel Valley Area 3 Superfund Site (EPA, 2008a)
	• Technical Evaluation of Environmental Data, Los Angeles County Sheriff's Department, Temple Station, Temple City, California (EPA, 2008b)
	• Data Validation Reports
	• San Gabriel Valley Area 3 Data Set (through December 2007), as Tables B-1 through B-3
	• Master List of Potential Contaminant Sources for San Gabriel Valley Area 3 Superfund Site (EPA, 2009), as Table B-4

2.1.1 Goals of RI Activities Conducted in 1999 – 2003

The first phase of the RI for Area 3 sought to meet the following goals.

- Define the vertical extent of groundwater contamination and identify the preferential depth intervals or migration pathways of COPCs in the aquifers.
- Define the lateral or areal extent of groundwater contamination.
- Identify locations and types of COPCs released in source areas.
- Assess hydrogeologic properties of the aquifers and develop an initial hydrogeologic conceptual site model.

The first phase of investigation activities consisted of installing **groundwater monitoring wells**, performing quarterly sampling, and compiling secondary data. Secondary data collection focused on obtaining sampling results and

groundwater level measurements from production wells throughout Area 3 and from groundwater monitoring wells at contaminant source facilities.

2.1.2 Goals of RI Activities Conducted in 2004 – Present

After evaluating the data set from the first phase of investigation activities and updating the hydrogeologic conceptual site model, additional data needs were identified. EPA initiated a second phase of RI activities with the following goals to fill data needs.

- Evaluate groundwater flow and COPC migration in Area 3, and characterize the geologic ***structural bedrock discontinuity*** with the installation of four EPA groundwater monitoring wells.
- Characterize the extent of contamination and assess adverse impacts to production wells by evaluating the data collected from the new EPA groundwater monitoring wells.
- Continue to monitor groundwater contamination and measure groundwater levels at the EPA groundwater monitoring wells.
- Analyze the quality of groundwater from three irrigation wells in Area 3 as part of the ecological risk assessment.

2.2 Data Quality Objectives

EPA implements a quality system to manage ***environmental data*** collection. The primary goal of the quality system is to ensure that the environmental data are of sufficient quantity and quality to support the intended use of the data. EPA follows a systematic approach to guide data collection, analysis, and interpretation and developed ***data quality objectives*** (DQOs) for implementation of the RI, referred to as the "RI Task," and for the six "RI Subtasks" listed below. The tables referenced in parentheses summarize the DQOs. Appendix C provides the data quality and usability assessment for the environmental data set for the RI.

Appendix C provides the data quality and usability assessment for Area 3.

Table 2-1 presents the DQOs for the RI Task.

- RI Task – Area 3 Remedial Investigation (Section 2, Table 2-1)
- Subtask 1 – Hydrogeologic Conceptual Site Model (Section 3, Table 3-1)
- Subtask 2 – Contaminant Source Identification (Section 4, Table 4-1)
- Subtask 3 – Contamination Migration Conceptual Site Model (Section 5, Table 5-1)
- Subtask 4 – ***Human Health Risk Assessment*** (Section 6, Table 6-1)
- Subtask 5 – ***Ecological Risk Assessment*** (Section 7, Table 7-1)
- Subtask 6 – Assessment of Next Steps (Section 8, Table 8-1)

The DQOs in Table 2-1 define the evaluations to be completed in the RI Task and identify potential evaluation results. Methods to avoid incorrect results are also

provided. Table 2-1 lists the data needs to complete the task and how the data will be used. Table 2-1 also includes an evaluation of the assessment conducted to determine the quality and usability of the data set.

Figure 2-1 presents the location of the monitoring wells and production wells in Area 3.

2.3 Remedial Investigation Main Accomplishments

EPA implemented the plans detailed in the field sampling plans (FSPs) and quality assurance project plans (QAPPs) for Area 3. During the RI, EPA solicited community input and kept the public informed of investigation activities. Evaluation of collected data helps to refine the initial hydrogeologic conceptual site model. Exhibit 2-2 summarizes the main accomplishments during the RI. Section 2.4 discusses the community involvement activities. Section 2.5 summarizes the activities to collect primary and secondary data. Section 2.6 describes the investigation of contaminant sources.

Exhibit 2-2 summarizes the main accomplishments during the RI.

EXHIBIT 2-2
Remedial Investigation Main Accomplishments for San Gabriel Valley Area 3 Superfund Site

RI Activity	Accomplishment
Data Evaluation and RI Planning	Completed two comprehensive data evaluations, documented in the 2001 Data Evaluation Report provided in Appendix B and in this RI report.
Community Involvement	Undertook an extensive community outreach program described in Section 2.4 and Exhibit 2-3 to engage the community in the Superfund process and keep the community informed of ongoing and planned activities.
Groundwater Monitoring Well Installation	Installed five ***conventional groundwater monitoring wells*** and four ***multiport groundwater monitoring wells*** in Area 3.
Collection of Primary Data	Monitored environmental data collected at multiple depths quarterly for up to 4 years at the eight EPA groundwater monitoring locations. Performed two rounds of groundwater quality monitoring at three irrigation wells at golf courses in Alhambra and San Gabriel. Measured groundwater levels at 104 groundwater wells in the Area 3, El Monte, and South El Monte ***Operable Units*** (OUs) during 2007.
Collection of Secondary Data	Evaluated environmental data compiled since 1993 from monitoring wells installed at 12 potential contaminant source facilities and 38 production wells. Compiled groundwater level measurements recorded since 1933 from groundwater monitoring wells at 12 facilities and 38 production wells.
Contaminant Source Investigations	Coordinated with the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) and the California Department of Toxic Substances Control (DTSC) collectively referred to as the State of California in this report, to screen over 500 businesses and facilities with historical operations that potentially involved use of COPCs in Area 3 as potential inspection targets. Provided oversight on contaminant source investigations in Area 3 described in Section 2.6.2.
Data Evaluation and Analysis	Developed a hydrogeologic conceptual site model based on data collected during the RI and during investigations conducted over a period of more than two decades in the San Gabriel Valley Groundwater ***Basin*** (San Gabriel Basin). Identified ***Key COPCs*** that include contaminants detected multiple times at production wells in Area 3 at concentrations that exceed the evaluation criteria. The RI report uses Key COPCs as a way of identifying regional contamination within Area 3. Evaluated the ***fate*** and transport of COPCs in groundwater. Conducted an assessment of potential risks posed to human health and the environment from COPCs in groundwater.

2.4 Community Involvement in Area 3

At the start of the RI, EPA engaged local agencies and community members affected by activities conducted in Area 3 to develop a ***community involvement plan*** (CIP). EPA interviewed residents, business representatives, and local government officials to understand the specific needs and concerns of the community. The CIP provided in Appendix A serves as a guide for sharing information with the community and involving the community in the decision making process. The CIP for Area 3 includes the following three main objectives.

Appendix A provides the CIP.

- Planning – Identify the affected communities and key stakeholders. Establish regular and open dialogue to respond to questions, concerns, and conflicts as they arise.
- Interaction – Provide opportunities for public participation that highlight and allow for consideration of community concerns in Area 3.
- Outreach – Provide to the public consistent, regular, and timely information about the investigation, cleanup plans, and other activities for Area 3.

EPA maintains information repositories for Area 3 at the public libraries in Alhambra, West Covina, and Rosemead and the EPA Region 9 office in San Francisco.

Exhibit 2-3 summarizes the community involvement activities completed during the RI.

Exhibit 2-3 summarizes the main accomplishments for community involvement during the RI.

EXHIBIT 2-3
Community Involvement Main Accomplishments for San Gabriel Valley Area 3 Superfund Site

Community Involvement Activity	Accomplishment
Community interviews	Conducted 22 interviews within the community in 2002.
Mailing list development	Developed and maintained mailing list of approximately 3,900 contacts for distribution of fact sheets and fliers.
Information repositories	Established and maintained four information repositories where the community can review project documents.
Fact sheet dissemination	Distributed fact sheets in English, Spanish, Chinese, and Vietnamese to inform the community of fieldwork and groundwater monitoring results.
Flier delivery	Distributed fliers in English, Spanish, Chinese, and Vietnamese to inform the community of well installation activities at eight locations and workshops held in 2005.
Residential relocation	Temporarily relocated several residents living adjacent to a well installation location to a hotel for one night while noisy construction activity occurred around the clock.
Construction signs	Placed construction signs in four languages at each well installation location to publicize EPA's toll-free information hotline and provide project fact sheets.
Public information meetings	Participated in meetings to share project information at the request of community members.
Workshops	Hosted two community workshops in 2005 to explain and discuss EPA's approach for assessing potential risks posed to human health by exposure to contaminated groundwater.
Open houses	Hosted community open house meetings in 2002 and 2004 to share information on activities to install groundwater monitoring wells.
Technical assistance	Awarded a technical assistance grant to the San Gabriel Valley Oversight Group, a group of concerned and interested community members, to help understand and interpret technical information about Area 3.

EPA solicits input from stakeholders including groundwater management agencies, local municipalities, and other interested parties. Exhibit 2-4 provides the list of stakeholders.

Exhibit 2-4 provides the list of stakeholders in Area 3.

EXHIBIT 2-4
List of External Stakeholders in San Gabriel Valley Area 3 Superfund Site

Stakeholder Category	Stakeholder
Local city governments	• Alhambra • Rosemead • San Gabriel • San Marino • South Pasadena • Temple City
EPA Technical Assistance Grant Recipient	• San Gabriel Valley Oversight Group
Potentially Responsible Parties	• Area 3 facility owners
County governments	• Los Angeles County
Local water resource management agencies	• Main San Gabriel Basin Watermaster • San Gabriel Basin Water Quality Authority • Raymond Basin Management Board
State government agencies	• California Department of Public Health • California Department of Toxic Substances Control • California Regional Water Quality Control Board – Los Angeles Region
Federal government	• Agency for Toxic Substances and Disease Registry

2.5 Investigation of Regional Groundwater Contamination

The basis of EPA's sitewide assessment of groundwater contamination underlying Area 3, as presented in this report, is data collected from groundwater monitoring wells and production wells. The comprehensive data set contains primary data and secondary data compiled to complete the RI Task and the six RI Subtasks listed in Section 2.2.

The primary data include analytical results and groundwater levels at the EPA groundwater monitoring wells, *lithologic logs*, ***geophysical logs***, and ***evaluation criteria*** including ***maximum contaminant levels*** (MCLs). The secondary data, obtained from other sources, include results from testing performed at production wells and facility groundwater monitoring wells located in contaminant source areas, lithologic logs, and State of California evaluation criteria including state MCLs or state ***notification levels*** (NLs). The ***EPA San Gabriel Basin Database*** contains the primary and secondary groundwater analytical data and groundwater levels.

2.5.1 Activities to Collect Primary Data

EPA's efforts to collect primary data for investigating regional groundwater contamination include the activities listed below.

- Groundwater monitoring well installation
- Groundwater level measurements
- Groundwater sampling
- Laboratory analysis of groundwater samples

The discussion that follows describes the methods used to accomplish these activities.

2.5.1.1 Groundwater Monitoring Well Installation

During RI activities, EPA installed nine conventional and multiport groundwater monitoring wells at a total of eight locations in the cities of Alhambra and San Gabriel, California. Figure 2-1 presents the locations of the monitoring wells in Area 3. EPA installed these wells to characterize lithology and groundwater contamination in the areas west and east of the structural bedrock discontinuity, and within the structural bedrock discontinuity.

Table 2-2 summarizes the key activities to install groundwater monitoring wells in Area 3, including steps in the overall well installation process; borehole drilling and ***geophysical logging***; well design and installation; well development and waste disposal; and well surveying.

The well installation reports provided in Appendix B (EPA, 2003c; EPA, 2006b) detail the well installation activities. The FSP and FSP Addendum included in Appendix A describe the waste management procedures followed during installation of monitoring wells.

Figure 2-1 depicts the specific locations of EPA monitoring wells. Exhibit 2-5 summarizes the general locations of monitoring wells within Area 3, and the rationale for the placement of the wells. Table 2-3 summarizes the well construction details for the groundwater monitoring wells and productions wells.

Figure 2-1 presents the location of the monitoring wells and production wells in Area 3.

Table 2-2 summarizes the key activities to install groundwater monitoring wells in Area 3.

Appendix A provides the FSP and FSP Addendum for the field activities in Area 3.

Appendix B provides the EPA well installation reports.

Exhibit 2-5 summarizes the locations of the EPA monitoring wells for Area 3.

Figure 2-1 presents the location of the monitoring wells and production wells in Area 3.

Table 2-3 summarizes well construction details for groundwater monitoring wells and productions wells.

EXHIBIT 2-5
Rationale for the Placement of the EPA Groundwater Monitoring Wells

Well Identification	Geographic Location in Area 3	Type of Well	Rationale for Well Placement
EPAMW11	SW	Conventional	Located where EPA anticipated encountering ***alluvium*** a few hundred feet thick.
EPAMW12A/ EPAMW12B	Central	Conventional	Located where EPA anticipated encountering alluvium a few hundred feet thick; identification of a structural bedrock discontinuity occurred later. Installed a pair of cluster wells approximately 6 feet apart to characterize and monitor groundwater at different depths at a single location; however, EPAMW12B has remained dry since installation.
EPAMW13	Central	Multiport	Placed near deep production wells that extend to depths of several hundred feet with long screened intervals or multiple screened intervals, or both, to investigate and identify specific depth intervals where detected contamination occurs in production wells.
EPAMW14	Central	Multiport	Placed near deep production wells that extend to depths of several hundred feet with long screened intervals or multiple screened intervals, or both, to investigate and identify specific depth intervals where detected contamination occurs in production wells.
EPAMW15	Central	Multiport	Placed near deep production wells that extend to depths of several hundred feet with long screened intervals or multiple screened intervals, or both, to investigate and identify specific depth intervals where detected contamination occurs in production wells.
EPAMW16	NE	Multiport	Placed near deep production wells that extend to depths of several hundred feet with long screened intervals or multiple screened intervals, or both, to investigate and identify specific depth intervals where detected contamination occurs in production wells.
EPAMW17	Central	Conventional	Located near a structural bedrock discontinuity inferred from data collected during first phase of the RI field activities.
EPAMW18	SW	Conventional	Placed near a structural bedrock discontinuity inferred from data collected during first phase of RI field activities.

Notes:
NE – northeastern
SW – southwestern

2.5.1.2 Groundwater Level Measurements

Groundwater levels measured in groundwater monitoring wells on a quarterly basis for up to 4 years support the development of the hydrogeologic conceptual site model of Area 3. A comprehensive set of groundwater level measurements collected during 2007 at groundwater monitoring wells and production wells located in the Area 3, El Monte, and South El Monte OUs help to refine the hydrogeologic conceptual site model.

Groundwater level measurements provide the basis for the assessment of groundwater flow conditions and contamination migration discussed in Sections 3 and 4. Pumping from production wells, recharge from rainfall, and recharge from infiltration at spreading basins affect groundwater levels at different locations and at various depths over time.

EPA uses an electronic water-level sounder to measure groundwater levels in conventional groundwater monitoring wells. In multiport groundwater

monitoring wells, EPA uses a dual-pressure probe and sampler developed by Westbay® Instruments, which is now owned by Schlumberger Water Services. EPA measures groundwater levels to the nearest hundredth of a foot (0.01 foot).

2.5.1.3 Groundwater Sampling

EPA samples groundwater at the eight EPA groundwater monitoring wells, shown on Figure 2-1. Sample collection at the four multiport groundwater monitoring wells encompasses 21 discrete depth zones. EPA also performed two rounds of groundwater testing and measured groundwater levels at three irrigation wells located at the Alhambra Municipal Golf Course and the San Gabriel Country Club.

Figure 2-1 presents the location of monitoring wells and production wells in Area 3.

The well type determines the sampling method, as indicated below:

- Conventional Groundwater Monitoring Wells – Sampled using dedicated ***bladder pumps*** located in the screened intervals and low-flow techniques for purging wells and collecting samples.
- Multiport Groundwater Monitoring Wells – Sampled at multiple separate screened intervals using specialized Westbay MP 38 System® equipment for purging screened zones and collecting samples.
- Irrigation Wells – Sampled using a procedure that includes purging a volume of groundwater equal to at least three times the volume of the well casing, and then filling sample containers directly from spigots at wellheads.

Exhibit 2-6 summarizes the analytical methods used for groundwater testing during the RI.

Exhibit 2-6 summarizes the analytical parameters for COPCs and laboratory analytical methods used for groundwater testing during the RI.

EXHIBIT 2-6
Summary of Analytical Parameters and Methods for Groundwater Testing

Parameter	Method[a]	Quantitation Limit (µg/L)[b]
Volatile organic compounds (VOCs)[b]	EPA Method 524.2 (Standard Operating Procedure 354)	Various
1,2,3-Trichloropropane (1,2,3-TCP)[c]	California Department of Health Method	0.005[d]
Semivolatile organic compounds (SVOCs)[b]	EPA Method 8270C	Various
1,4-Dioxane[c]	EPA Method 8270C/Selected Ion Monitoring	0.1 – 1.3
n-Nitrosodimethylamine (NDMA)[c]	Modified EPA Method 1625	0.002
Nitrate	EPA Method 300.0	50 – 100
Perchlorate[c]	EPA Method 314	1 – 2
Hexavalent chromium[c]	EPA Method 218.6	0.2 – 1
Dissolved metals[b]	EPA Methods 200.7, 200.8, 200.9 and 245.1	Various

[a]The QAPP (EPA, 2003b) in Appendix A includes a detailed description of analytical methods.
[b]The QAPP (EPA, 2003b) in Appendix A includes a complete list of analytes, quantitation limits, and evaluation criteria.
[c]***Emergent chemical.***
[d]The NL of 0.005 is used as the evaluation criterion.
µg/L – micrograms per liter.

EPA tested groundwater samples for VOCs quarterly and for other COPCs less frequently. The widespread presence of the ***trichloroethene*** (TCE) and ***tetrachloroethene*** (PCE) in groundwater, as described in Section 4.3, made quarterly VOC testing essential. Table 2-4 lists the COPCs analyzed in groundwater samples collected in Area 3.

Table 2-4 lists the COPCs analyzed in groundwater samples collected in Area 3.

2.5.1.4 Laboratory Analyses of Groundwater Samples

To generate data of acceptable and known quality, EPA selects analytical methods with adequate sensitivity and sufficient quality assurance/quality control (QA/QC) checks. Analysis of QA/QC samples and performance evaluation samples demonstrates the precision and accuracy of the analytical methods. Appendix C provides the data quality and usability assessment for the environmental data set for Area 3.

EPA also evaluates chemical data for ***tentatively identified compounds*** in groundwater reported by analytical laboratories. Review of data for tentatively identified compounds helps to reduce the possibility of missing COPCs not included on the target analyte list.

2.5.2 Activities to Collect Secondary Data

Approximately 60 percent of the records in the RI data set comprise secondary data obtained by EPA from other sources. Appendix C discusses the data quality and usability assessment for the secondary data obtained from external data sources during the RI.

Appendix C provides the data quality and usability assessment for Area 3.

2.5.2.1 Data Collection from Production Wells

EPA routinely receives environmental data transmitted by the State of California and the Main San Gabriel Basin Watermaster (Watermaster) for groundwater testing performed at production wells in the San Gabriel Basin.

The water purveyors sample and analyze groundwater from drinking water production wells in accordance with California Code of Regulations (CCR) Title 22, Chapter 15 (Title 22). The required analyses target analytes with established MCLs. Additional analytes include parameters with NLs determined by the California Department of Public Health (DPH), including emergent chemicals such as perchlorate. The frequency of sampling varies depending on the status of a well (active or inactive) and on previous detections of COPCs.

2.5.2.2 Data Collected from Facility Groundwater Monitoring Wells

EPA also obtained secondary data for facilities in Area 3 from case files and Web sites maintained by the State of California. The case files compile various records, including groundwater monitoring reports, ***soil vapor*** extraction reports, investigation reports, RI reports, closure reports, and work plans. Online databases include the Geotracker Web site (http://geotracker.swrcb.ca.gov/) and the EnviroStor Web site (www.envirostor.dtsc.ca.gov/public/).

EPA identified 33 facility groundwater monitoring wells installed at 12 facilities from 1993 through 2007 in Area 3. Section 2.6.2 describes LARWQCB's process for identifying facilities targeted for the installation of monitoring wells to investigation groundwater contamination.

2.6 Investigation of Contaminant Sources

In 2000, EPA coordinated with LARWQCB to initiate investigations of potential sources of VOC contamination in groundwater underlying Area 3. LARWQCB continues to lead the contaminant source investigations in Area 3 for the State of California, with the exception of two investigations led by DTSC. In addition, EPA assumed responsibility for lead regulatory oversight of the investigation at one facility in 2006.

Table B-4 presented in Appendix B provides the potential contaminant source master list for Area 3.

The discussion in Section 2.6.1 describes the general approach that EPA and LARWQCB use to investigate contaminant sources in Area 3. Table B-4 in Appendix B provides the potential contaminant sources master list, which catalogs the individual facilities identified for consideration as potential sources of contamination. Section 4.3 and Table 4-9 present the results of specific contaminant source investigations conducted at facilities in Area 3.

Section 4.3 and Table 4-9 present the results of specific contaminant source investigations conducted at facilities in Area 3.

2.6.1 EPA Potentially Responsible Parties Search Process

EPA's search for ***potentially responsible parties*** (PRPs) focuses on collecting evidence to establish the liability of current and former owners and operators of facilities responsible for the release of COPCs in groundwater underlying Area 3. Search tasks to identify and locate current and former PRPs include the following.

- Reviewing files and collecting records
- Reviewing field data collected during the RI
- Reviewing information on current and historical groundwater flow directions
- Reviewing records of land use that identify areas of historical industrial or commercial activity
- Issuing information request letters
- Conducting interviews
- Performing title searches
- Conducting business status and financial research
- Developing site summaries

EPA initiated the background search in 2002 and reviewed and compiled records maintained by local, state, and federal regulatory agencies. In addition to evaluating information on current and former owners and operators, EPA

researched potential use and onsite release of COPCs at facilities. Collectively, the records identified over 2,100 businesses that operated at approximately 600 addresses within the site boundaries from 1920 to the present.

The use of a database and geographic information system enabled EPA and LARWQCB to overlay areas of groundwater contamination with locations of industrial activities. In such areas, the likelihood is high that facility operations involved the use of COPCs at one time or involve use of COPCs today.

EPA and the State of California continually exchange information on the PRP search, and EPA provides recommendations for further investigation, such as subsurface sampling, at specific facilities to obtain more information.

2.6.2 LARWQCB Subsurface Investigation Process

In seeking to identify potential sources of contamination, LARWQCB's investigation process initially targets a wide range of facilities for screening to help ensure that the search captures all likely candidates for evaluation. An overwhelming majority of the facilities initially identified will prove to require no further investigation.

Contaminant source investigations led by LARWQCB involve currently operating businesses or properties with identified owners or operators. LARWQCB evaluates the possibility that past or present facility operations have released COPCs. LARWQCB assesses the operations of each facility based on the practices listed below.

- Types and quantities of chemicals used
- Types and conditions of chemical storage areas and equipment used
- Chemical conveyance methods used
- Onsite waste storage, treatment, and disposal practices used

Exhibit 2-7 summarizes the LARWQCB activities to identify contaminant sources in Area 3.

Exhibit 2-7 summarizes the activities initiated by LARWQCB to investigate contaminant sources within Area 3.

EXHIBIT 2-7
Summary of Area 3 Contaminant Source Investigation Activities Initiated by LARWQCB

Activity	Estimated Number
Chemical use questionnaires issued	500
Facilities inspected	420
Soil vapor investigations initiated	51
Groundwater investigations initiated	12
Soil cleanups initiated	5

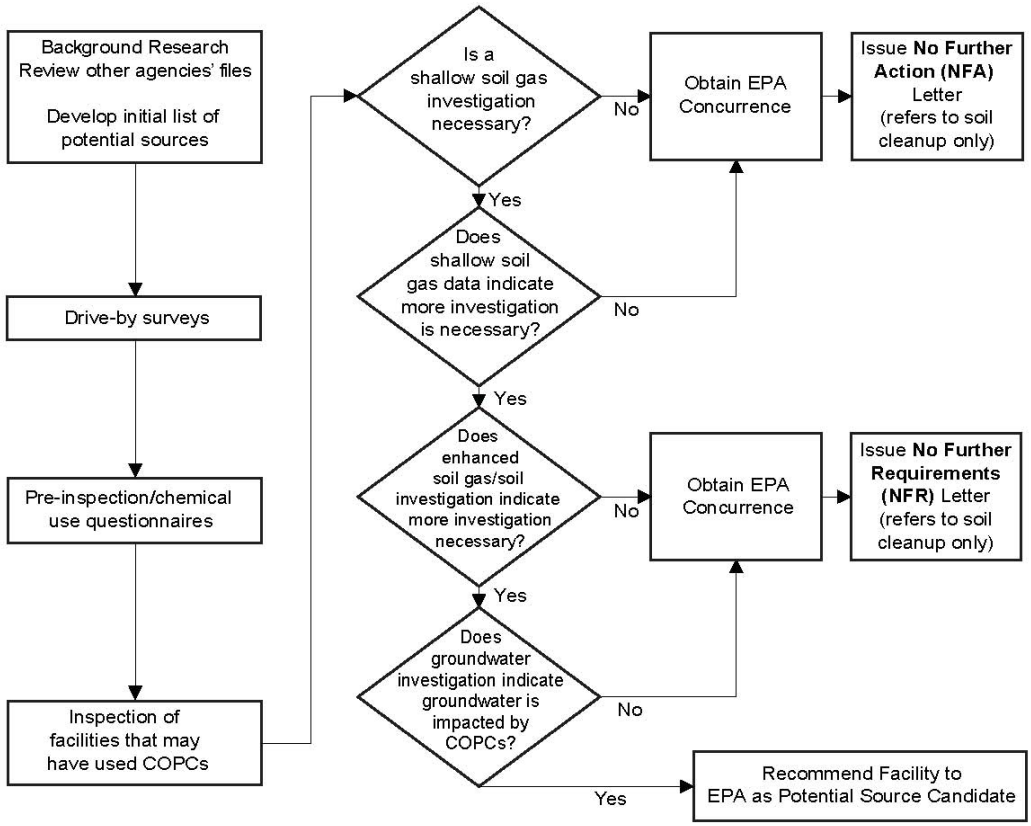
LARWQCB investigates locations of potential COPC releases based on information provided by facility owners or operators and on findings from

facility inspections. As shown in Exhibit 2-8, LARWQCB initiates the following activities if an inspection determines that subsurface investigation is warranted.

- Investigation of Shallow Soil Vapor Contamination – Facility directed to complete a shallow subsurface investigation that includes sampling, testing soil vapor for volatile COPCs, and evaluating the vapor intrusion pathway.
- Investigation of Deep Soil Vapor Contamination – Facility directed to conduct an enhanced subsurface investigation that involves sampling and testing volatile COPCs in soil vapor and soil at depth. The presence of COPCs at concentrations that exceed evaluation criteria triggers further investigation or remediation or both.
- Investigation of Groundwater Contamination – Facility directed to install a groundwater monitoring well and to conduct a groundwater investigation for COPCs.
- Contaminant Source Remediation – Facility directed to characterize the nature and extent of contamination and to evaluate the necessity and feasibility of remediating the contaminant source.

Exhibit 2-8 summarizes the LARWQCB's contaminant source identification process.

EXHIBIT 2-8
LARWQCB Contaminant Source Investigation Process



2.7 Summary of EPA Activities for the RI

Data collected for the RI provides the ability to better evaluate the distribution of COPCs in groundwater and to identify potential sources of contamination in Area 3. The data quality and usability assessment presented in Appendix C shows that the environmental data collected to evaluate the nature and extent of the regional groundwater contamination generally meet the DQOs developed by EPA for the RI. The data assessment determined that the primary and secondary environmental data are of sufficient quality to support the conclusions and recommendations of the RI. Sections 3 through 8 of this report present, evaluate, and interpret the results of the RI.

Glossary

Glossary

alluvium: Sediment deposited by flowing water, as in a riverbed, flood plain, or delta.

aquifer: A saturated fine-grained geologic unit, often of sand or gravel, which contains and transmits significant quantities of water under normal conditions.

basin: A large geologic depression in the bedrock that is filled with unconsolidated sediments.

bladder pump: A pump used for low-flow groundwater sampling consisting of a flexible, squeezable bladder encased in a rigid outer casing.

community involvement plan: A blueprint for community involvement objectives and activities pertaining to a specific site.

conceptual site model: A planning tool that provides the framework from which the study design is structured. It is frequently created as a site map that organizes information that already is known about a site.

confining unit: A relatively low-permeable geologic unit (aquitard) that is adjacent to one or more higher-permeable geologic units (aquifers). Confining units create pressurized groundwater conditions within aquifers.

contaminant: A substance not naturally present in the environment or present in unnatural concentrations that can, in sufficient concentration, adversely alter an environment.

contaminants of potential concern: Contaminants that potentially pose a risk to human health or the environment.

contamination: The presence of hazardous substances in the environment.

conventional groundwater monitoring well: A groundwater monitoring well completed with one screened interval for monitoring one depth interval of an aquifer.

data quality objectives: Performance and acceptance criteria that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

ecological risk assessment: A process for systematically evaluating the likelihood that **adverse** ecological effects may occur as a result of exposure to one or more **contaminants.**

electrical conductivity: A parameter commonly measured when collecting or analyzing groundwater samples which is a measure of the ability of water to conduct an electric current.

emergent chemical: A compound of concern due to detection in groundwater or surface water. The compound has acute or chronic health affects in humans.

evaluation criterion: A standard or reference point on which a decision will be assessed.

environmental data: Any measurements or information that describe environmental processes, location, or conditions; ecological or health effects and consequences; or the performance of environmental technology.

EPA San Gabriel Basin Database: A collection of electronic data maintained by EPA from testing performed at groundwater wells throughout the San Gabriel Valley. The database includes construction information and historical laboratory data from monitoring wells and production wells.

fate: The processes by which the contaminant moves through and is transformed in the environment.

feasibility study: The mechanism for the development, screening, and detailed evaluation of alternative remedial actions.

geophysical logging: The process of measuring properties of subsurface geologic materials by recording a graphical representation of the measurements or log; commonly used to determine soil or rock type and the location of the water table.

geophysical log: A graphical representation record of properties of subsurface geologic materials; commonly used to determine soil or rock type and the location of the water table.

groundwater: Water occurring underground, in the zone of saturation in an aquifer.

groundwater monitoring well: A type of well specially designed and installed to sample groundwater at specific locations and depths to evaluate groundwater flow and contamination.

human health risk assessment: Qualitative and quantitative evaluation of the risk posed to human health by the actual or potential presence of specific contaminants.

information repository: A location where selected documents about the site are available for public review.

Key contaminants of potential concern: The contaminants detected multiple times in groundwater at production wells within Area 3 at concentrations that exceed evaluation criteria.

lithologic logging: The process of visually observing, manually testing, describing, and recording in a log the type of rock and/or soil encountered at depth, as recorded when drilling a borehole.

lithologic log: Record of visual observations and manual testing that describe the type of rock and/or soil encountered at depth, as described when drilling a borehole.

lithologic units: A type of stratigraphic unit or body of soil or rock interpreted as having similar composition and texture (lithology) and sufficient lateral and vertical extent to be considered a unit.

maximum contaminant levels: The maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

multiport monitoring well: A type of monitoring well equipped with a sampling port for monitoring groundwater at multiple depth intervals of an aquifer.

notification level: Health-based advisory levels (formerly referred to as Action Levels) established by the California Department of Public Health for certain chemicals for which no established drinking water standards exist.

operable unit: A subunit of a Superfund site, defined based on a geographical area or on another parameter, where a number of separate activities are undertaken as part of site cleanup.

permeability: The property of soil, sediment, or rock to transmit fluid.

pH: The measure of the acidity or alkalinity of a solution. pH for water is 7.0. Solutions less than 7.0 are considered acidic and solutions greater than 7.0 are considered alkaline.

porosity: The fraction of the total volume of a porous material (i.e., soil or rock) that is occupied by void space.

potentially responsible parties: Entities that are potentially responsible for generating, transporting, or disposing of the hazardous waste found at a site.

primary data: Data generated or collected by the investigator during an investigative process.

recordation number: A number assigned by the Main San Gabriel Basin Watermaster to each production well located in the San Gabriel Basin, used for recordkeeping purposes.

remedial investigation: Actions undertaken to characterize the full nature and extent of contamination, including characterization of hazardous substances, identification of contaminant sources, and assessment of human health and ecological risk.

secondary data: Data collected or generated by a party other than the investigator during the investigative process.

semivolatile organic compound: An organic (carbon-containing) compound that evaporates when exposed to temperatures above room temperature.

soil vapor: Elements and compounds in a gaseous state in the small spaces between particles of soil. Such gases can be moved or driven out under pressure.

stratigraphic units: A body of soil or rock (stratum) or group of several bodies of soil or rock (strata) recognized or interpreted as a distinguishable unit based on unique lithology, fossil content, age or other properties.

structural bedrock discontinuity: In structural geology, a subsurface bedrock zone or surface separating two unrelated groups of rocks across which an abrupt geologic change occurs, e.g., a fault.

Superfund: The program operated under the legislative authority of CERCLA and SARA that funds and carries out EPA solid waste emergency and long-term response actions, including conducting or supervising cleanup actions.

tentatively identified compound: A compound which can be detected by an analytical method but the concentration cannot be confirmed without additional analytical testing.

tetrachloroethene: A volatile organic compound primarily used for dry cleaning clothing and in manufacturing processes as a solvent and metal degreaser.

trichloroethene: A volatile organic compound that is a colorless or blue organic liquid with a chloroform-like odor. TCE is primarily used in manufacturing processes as a solvent, metal degreaser, and textile degreaser.

turbidity: A parameter commonly measured when collecting or analyzing groundwater samples. Turbidity measures the cloudiness that tiny particles suspended in water cause.

Unified Soil Classification System: The soil classification system used in engineering and geology disciplines to describe the texture and grain size of a soil.

volatile organic compound: An organic (carbon-containing) compound that evaporates readily at room temperature.

Tables

Figures