

Section 1

Section 1

Introduction

On behalf of the Omega Chemical Site PRP Organized Group (OPOG), Camp Dresser & McKee Inc. (CDM) has prepared this On-Site Soils Remedial Investigation (OSS RI) Report for the Omega Chemical Superfund Site (Site). This report was prepared in accordance with Task 2 of the Statement of Work (SOW) in *Consent Decree No. 00-12471 between the United States Environmental Protection Agency (USEPA) and OPOG (USEPA, 2001)*. The Consent Decree was lodged on November 24, 2000 and entered into the US District Court on February 28, 2001. Task 2 required OPOG to "Implement a Vadose Zone Remedial Investigation/ Feasibility Study (RI/FS) For Contaminant Releases On, At, or Emanating From the Former Omega Property". Therefore, the term "Site" as used throughout this document encompasses the former Omega Chemical property as well as adjacent and nearby properties where the underlying vadose zone has been impacted by contamination derived from the former Omega Chemical property.

The former Omega Chemical property consists of the two parcels located at 12504 and 12512 Whittier Boulevard. The former Omega Chemical property and Phase 1a area are illustrated on Figure 1-1. The Consent Decree defines the Phase 1a area as the area of soil and groundwater contamination associated with the Omega property and extending downgradient for approximately 100 feet southwest of Putnam Street, Whittier, California. A groundwater remedy in the Phase 1a area is currently being implemented along Putnam Street in accordance with Task 1 of the Consent Decree. The groundwater remedy is expected to be operational during the third quarter of 2008.

1.1 Project Objectives

The RI was conducted to characterize the nature and extent of contamination in Site soils to support the data needs of the risk assessment, feasibility study, remedial design, Agency of Toxic Substances and Disease Registry (ATSDR) Public Health Assessment and Natural Resource Trustee. This report documents the methodology used, analytical summary, Site Conceptual Model (fate and transport), findings, and conclusions of the RI. A Human Health Risk Assessment (the "HHRA") for On-Site Soils has also been prepared concurrently with this document and the final HHRA was recently submitted to USEPA (CDM, November 9, 2007).

Section 5 of this RI Report provides the Site Conceptual Model for the Site. Data and graphical depictions thereof provided in that section define the lateral and vertical extent of contamination in the vadose zone for the Site. These data, and accompanying interpretation, are adequate to complete the development, screening, and evaluation of remedial alternatives through the Feasibility Study (FS) process, including estimation of costs associated with the remedial alternatives in the FS. The data are also adequate to complete the HHRA. This RI Report compares observed soil and soil vapor concentrations in the vadose zone to USEPA Preliminary Remediation

Goals (PRGs) and California Human Health Screening Levels (CHHSLs), respectively. Because both of these criteria are relatively generic screening criteria, the HHRA proposes Site-specific Health Based Remediation Goals (HBRGs). Once approved by USEPA, HBRGs will be used to assist in the selection, design, and implementation of the appropriate remedial measures.

Evaluation of remedial action alternatives will be addressed in the Feasibility Study (FS) Report, which will be submitted separately 60 days following USEPA approval of the RI Report or HHRA, whichever is approved later.

1.2 Scope of Work

The initial scope of work for the RI was based upon the activities outlined in the *OSS RI/FS Work Plan* (CDM, September 29, 2003). Additions to the scope of work, preliminary data evaluations, and findings were documented in two work plan addenda and four technical memoranda to USEPA, as follows:

- *OSS Work Plan Addendum SOW for Additional Investigation* (CDM, October 20, 2004).
- *Final OSS RI/FS Work Plan Addendum No. 2 SOW for Additional Investigation* (CDM, August 17, 2005).
- *OSS RI/FS Work Plan Addendum No. 2 Summary of Initial Findings from Soil Vapor and MIP Sampling with Recommendations for Additional Sampling Locations* (CDM, November 1, 2005).
- *OSS RI/FS Work Plan Addendum No. 2 Summary of Additional Findings from Soil Vapor and MIP Sampling* (CDM, January 27, 2006).
- *OSS RI/FS Work Plan Addendum No. 2 Summary of Additional Findings from Soil Vapor and MIP Sampling* (CDM, April 14, 2006).
- *Analytical Results for Final Vapor Probes (VP26, VP27, and VP30)* (CDM, June 30, 2006).

The following tasks were completed during implementation of the RI:

- *Surface soil sampling:* Samples were collected immediately beneath the paved surface from a depth of approximately 0 to 6-inches below ground surface (bgs) at 20 locations at the former Omega Chemical property.
- *Subsurface soil sampling:* Eight borings (GP-1 through GP-8) were initially advanced at the former Omega Chemical property and adjacent Terra Pave property using a direct push drilling system. The borings were continuously logged, and samples were collected at discrete depths. In addition to the eight borings, soil samples were collected and analyzed to confirm membrane interface probe (MIP) detector responses.

- *MIP testing:* MIP testing was performed at 30 different locations at the Site. Soil and soil vapor samples were collected and analyzed adjacent to the MIP boreholes to confirm MIP detector responses.
- *Soil vapor sampling:* Soil vapor sampling was conducted at the Site. Twelve locations were sampled at single depths along utility corridors, while 38 locations were sampled at multiple depths. Many of the soil vapor sampling and analysis activities were conducted adjacent to MIP borings to confirm the concentrations observed using that method.
- *Indoor and ambient air sampling:* Air quality samples were collected at the two buildings located on the former Omega Chemical property, as well as many neighboring buildings to evaluate possible soil vapor migration. Upwind ambient air samples were also collected to determine background concentrations.
- *Heating, Ventilating, and Air Conditioning (HVAC) system evaluations:* HVAC systems at several neighboring facilities were evaluated to determine if the buildings were improperly ventilated, which could influence the indoor air sampling results.
- *Chemical usage surveys:* Chemical inventories and usage surveys were conducted at the former Omega Chemical property and neighboring facilities to determine whether detected chemicals of concern in indoor air quality samples were from present usage or from soil vapor intrusion.
- *Soil vapor testing and mitigation at Skateland:* Sub-slab depressurization (SSD) testing was performed at Skateland to evaluate SSD as a possible remedial alternative. Mitigation measures performed at Skateland included installing air purifiers in the restrooms and kitchen. Field procedures, results, and an evaluation of the data were provided to USEPA in the *Skateland Sub-Slab Depressurization Testing Technical Memorandum* (CDM, December 16, 2005). With OPOG's purchase of the property on October 1, 2006 and the subsequent closing of the skating rink, additional SSD work is no longer required at this property.
- *Soil vapor extraction well installation and pilot testing:* 13 soil vapor extraction (SVE) wells and 3 vapor monitoring points (VMPs) were installed, and initial and expanded soil vapor extraction pilot testing was performed at the former Omega Chemical property to support preparation of the FS.
- *Data evaluation:* Several memoranda were prepared for USEPA which provided the results of the investigations and preliminary findings. This document summarizes those findings as well as those not already documented.

Although this report focuses upon Site soils, soil vapor, and air, groundwater sampling was also conducted as part of the Phase 1a groundwater investigation. Groundwater sampling procedures and analytical results will be presented briefly in this document in support of the Site Conceptual Model.

1.3 Report Organization

This report is organized into seven sections, as follows:

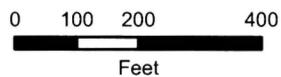
- Section 1 - Introduction
- Section 2 - Background
- Section 3 - Field Activities
- Section 4 - Results
- Section 5 - Site Conceptual Model
- Section 6 - Conclusions
- Section 7 - References

Figures presented in this report are provided at the end of each section where they are first discussed. Appendices are provided at the rear of the document.



Legend

- Omega Chemical Property
- Phase Ia Area



Omega Chemical

Site Location Map

Figure 1-1

Section 2

Section 2 Background

The following section presents information regarding the regulatory history of the former Omega Chemical property, past and present conditions and operations at the former Omega Chemical property, current operations at neighboring properties, and physical setting of the Site.

2.1 Regulatory History

The regulatory history of the former Omega Chemical property was based upon information summarized in the *OSS RI/FS Work Plan* (CDM, September 29, 2003) and in the Request for a Removal Action (USEPA, April 6, 2006).

The Omega Chemical Corporation (Omega) was a refrigerant/solvent recycling operation from approximately 1976 to 1991. Drums and bulk loads of waste solvents and chemicals from various industrial activities were processed to form commercial products. Wastes generated from treatment and recycling activities included still bottoms resulting from distillation of spent solvents, aqueous fractions, and non-recoverable solvents.

Environmental regulatory action at the Omega Chemical property began with several notices of violations (NOVs) from the Los Angeles County Department of Health Services (DHS). On November 1990, Los Angeles County Superior Court issued a preliminary injunction to prevent further acceptance of hazardous waste by Omega. In February 1991, Los Angeles County and San Bernardino County District Attorney's offices issued warrants to search three railcars at the Omega Chemical property. The search revealed illegal storage and transport of 700 hazardous waste drums, falsified waste manifests and drum labels. As a result, Los Angeles County Superior Court ordered Omega to cease all operations, remove all hazardous wastes, and close the facility. USEPA entered into an Administrative Order of Consent, in October 1991 requiring Omega to perform several interim measures to mitigate current or potential threats to human health and the environment and to submit a Resource Conservation and Recovery Act (RCRA) facility investigation. At this time, California Environmental Protection Agency (Cal/EPA)/Department of Toxic Substances Control (DTSC) was the lead agency at the Omega Chemical property.

Although the Omega facility officially closed in 1991, the president and owner of the company continued to operate under a different company name on a limited basis accepting primarily refrigerants (Freons). DTSC requested assistance from USEPA to conduct a site assessment in August 1993. The site assessment inspection revealed that approximately 2,900 drums of hazardous waste were at the Omega Chemical property in weathered condition, but not completely corroded nor leaking. In 1995, the Los Angeles County Superior Court found the company manager guilty for contempt of court and was ordered to cease all operations. Operations ceased at the Omega Chemical property at that time.

On May 9, 1995, USEPA issued a Unilateral Administrative Order (UAO) to Potentially Responsible Parties (PRPs) that had shipped more than ten tons of hazardous wastes to the former Omega Chemical property. At that time, USEPA became the lead agency for the Site. The PRPs subsequently formed a group and established the Omega Chemical Site PRP Organized Group (OPOG) to perform the work. Between 1995 and 1996, OPOG removed approximately 2,700 drums from the former Omega Chemical property and conducted a preliminary site investigation. By that time a majority of the drums were in extremely poor condition, and spills were observed in numerous locations. The Site was placed on the National Priorities List (NPL) in January 1999. OPOG entered into the Consent Decree and associated Statement of Work in February 2001. The Statement of Work requires the performance of the following three tasks:

1. Design and implement a ground water containment and mass removal treatment system in the Phase 1a Area.
2. Implement a vadose zone soils RI /FS to characterize releases on, at, or emanating from the Site.
3. Install three sentinel groundwater wells at two or three locations downgradient of the Phase 1a Area and upgradient of water supply well 30R3.

This RI was conducted to partially fulfill Task 2 above.

Upon evaluating data collected for the RI, it was found that soil vapor had migrated into several buildings near or at the former Omega Chemical property including Skateland, an indoor skating rink. USEPA issued a Request for a Removal Action to mitigate the soil vapor intrusion on April 6, 2006. OPOG entered into the First Amendment to the Consent Decree and associated Supplemental Statement of Work to mitigate the indoor vapor exposure at Skateland or conduct an Alternate Response Action (USEPA, April 6, 2006). After undertaking some of the testing work prior to selecting an appropriate mitigation measure, OPOG elected to conduct an Alternate Response Action by purchasing the property, closing Skateland operations, and demolishing the building.

2.2 Former Omega Chemical Property History and Operations

2.2.1 Current Use

Van Owen Holdings LLC of Los Angeles, California purchased the former Omega Chemical property in 2003. The former Omega Chemical property is divided into two parcels:

- Northern parcel: 12504 Whittier Boulevard. Currently being leased by Star City Auto Body to conduct automotive body repair and painting. The auto body shop

also leases the small paved parking lot north of the warehouse building for automobile parking.

- Southern parcel: 12512 Whittier Boulevard. The former administrative building and paved parking area south of the warehouse have had a variety of tenants since the 2003 purchase of the former Omega Chemical property. The former administration building is currently vacant, and the parking lot is used for temporary storage of wooden pallets by L&M Pallets on a month-to-month lease basis. The building was previously used for administration and equipment storage, while the concrete paved exterior yard was used for parking and temporary storage of heavy construction equipment. Ten soil vapor extraction (SVE) wells were installed at five locations in the parking lot during September 2006, and the area is also being used by OPOG for SVE pilot testing purposes.

2.2.2 Owners and Operations

The known environmental history of the former Omega Chemical property was documented in the *Data Summary Report* (DSR) (CDM, December 4, 2001). The property was developed in 1951 and occupies Los Angeles County Assessor Tract No. 13486, Lots three and four. The property is approximately 41,000 square feet in area (200 feet wide x 205 feet long), which is equal to about one acre. As shown on Figure 2-1, two structures are located on the property – an approximately 140 by 50 foot warehouse and an approximately 80 by 30 foot administrative building. These buildings comprise about one-quarter of the property. A loading dock is attached to the rear of the warehouse. The property is paved with concrete and secured with a seven-foot high perimeter fence and locking gate. The fence is topped with razor wire. Prior to construction of the buildings in July 1951, the property was used for agriculture.

A summary of former Omega Chemical property owners/operators is provided below:

- Late 1930s – property was undeveloped or used for agricultural purposes.
- 1951 – property developed, office and warehouse were constructed for Sierra Bullets. During operation of the Sierra Bullet facility, a 500-gallon underground storage tank (UST) was utilized for storage of kerosene.
- 1963 through 1966 - property purchased and occupied by Fred R. Rippy, Inc.
- 1966 through 1971– property used to convert vans to ambulances.
- 1971 through 1976 – property occupied by Bachelor Chemical.
- 1976 – Omega Chemical (Mr. Dennis O'Meara) purchases Bachelor Chemical Processing (northwestern half) and assumes the property lease from Rippy.

- 1987 – Omega Chemical purchases the leased parcel and adjoining southeastern section from Rippy.
- April 11, 1991 – Omega ordered by the Superior Court of the County of Los Angeles to cease operation, remove all hazardous wastes, and close the facility.
- September 1991 – Omega files Chapter 11 bankruptcy, which was dismissed on September 7, 1993.

The Omega facility provided treatment of commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and or disposal facilities. According to the October 29, 1990 Operation Plan for Hazardous Waste Recovery Facility, the Omega facility maintained 11 treatment units comprised of distillation columns, reactors, wipe film processor, liquid extractor, and a solid waste grinder. The facility also maintained 22 stainless steel tanks with capacities ranging from 500 to 10,000 gallons, and 5 carbon steel tanks with capacities of 5,000 gallons.

From approximately 1999 through 2001, the northern parcel (12504 Whittier Boulevard) was leased by Mr. Nicholas Stymuiank who occupied the warehouse and stored miscellaneous equipment and materials in the warehouse and service yards. The warehouse was converted in 2003 for use by Star City Auto Body for auto body repair.

During the past few years, several tenants have occupied the southern parcel (12512 Whittier Boulevard). C&I Electric utilized the property for equipment and billboard storage. Following the termination of the C&I Electric lease, 3 Kings Construction occupied the property. In December 2006, L&M Pallets began leasing the exterior yard for pallet storage.

2.2.3 Review of Historical Aerial Photographs

An Aerial Photographic Analysis of the former Omega Chemical property was completed in April 2000 (USEPA, April 2000). A total of 13 dates of aerial photographs for the years from 1928 to 1994 were reviewed. The objective of the analysis was to document features and activities of environmental significance including surface morphology, property use, and evidence of hazardous waste disposal at the former Omega Chemical property in support of the Site investigation. Observations discussed in the review are summarized below. Figure 2-1 identifies features tentatively identified in the photographic review. Locations of former tanks and a former 500-gallon UST (which was removed in August 1987) are also identified on the figure.

The property was used for agricultural purposes as an orchard between 1928 and 1946. The 1956 photograph shows that the property was developed with a warehouse and office building. Spillage or other surface discoloration was noted in the unpaved

yard south of the warehouse (hereinafter referred to as the "southern yard"). The yard north of the warehouse (hereinafter referred to as the "northern yard") appears to have been paved and was used for parking. In the 1959 photograph, spillage and/or surface staining was again noted in the unpaved southern yard. An area of mounded earthen material was also observed within the southern yard. Staining was also observed in the 1956 and 1959 photographs at nearby properties to the northwest of the property.

The spillage and staining observed at the property in 1956 and 1959 were not noted in the 1963 photograph. The 1966 photograph shows some surface staining, a small access road leading off the property, and mottled-toned surface coloration typical of vegetation stress. The 1970 photograph shows at least half of the southern yard to be paved, with possible disturbed ground in the rear portion of the property. In 1972, paving was observed throughout the property. In addition, a number of vehicles and/or containers were observed in both the northern and southern yards.

The 1978 photograph shows the initial evidence of chemical use at the former Omega facility. Five vertical tanks were observed in the northwestern corner of the property, and stacked drums and small areas of spillage were noted in the northern yard. Two notable areas of staining and/or spillage were observed emanating from both the northwestern and southwestern side of the office building toward the center of the southern yard. The soil within the western portion of the southern yard appears to be exposed with locations of mounded material (possible excavation).

In 1984, a total of nine vertical and two horizontal tanks were observed in the northwestern portion of the property. The northern yard appears to be full of drums and small storage containers. A large stain and/or spillage was observed close to the center of the western side of the office building. A bulldozer and various toned materials suggestive of earthmoving activities were noted in the southwestern portion of the property. The earthmoving activities may have been in preparation for the installation of six vertical tanks observed in this area in the 1989 photograph. The resolution of this photograph was poor; however, up to 12 additional vertical tanks were noted in the northwest corner and stacked rectangular objects were observed in the central portion of the southern yard.

In 1993, seven of the vertical tanks and the two horizontal tanks observed in the northwest corner of the property were no longer present. Instead, five vertical tanks (two different sizes) were located in the northern yard along with stacked crates. The six vertical tanks located within the southwest portion of the property were still present in both the 1993 and 1994 photographs. In 1994, two additional vertical tanks were observed in the northwest portion of the property. The yards still contain stacked crates. The 1994 photo was the final year included in the aerial photographic analysis.

2.2.4 Facility Processes and Chemical Usage

Limited information regarding volumes and types of wastes handled by Omega was available for review. A Phase II Close Out Report, prepared by England & Associates and Hargis + Associates (England & Hargis, 1996) in 1996, summarized available Omega Chemical information for the period from 1985 through mid-1996, as well as background information (ownership and operational history, geology, hydrogeology, etc).

According to the Phase II Close Out Report, Omega operated the facility for recycling and treatment of spent solvent and refrigerant. Drums and bulk loads of waste solvents and chemicals (primarily chlorinated hydrocarbons and chlorofluorocarbons) from various industrial activities were processed to form commercial products, which were returned to generators or sold in the marketplace. An Operation Plan, prepared by Omega in 1990 for proposed expansion of the facility, provided a summary of current and proposed facility processes, tank capacities, incoming and facility-generated waste stream characteristics and handling practices, etc.

Eleven treatment facilities were present in 1990. The majority of these treatment units were located in the general area of the warehouse loading dock. The Operation Plan listed the following storage facilities:

- Storage Tanks A through F – six stainless steel tanks with 10,000-gallon storage capacity per tank.
- Miscellaneous Named Tanks – 16 stainless steel tanks (Heidi, Jenny, Elaine, Amy, etc.) with the following storage capacities: 1 x 5,000 gallon, 1 x 3,500 gallon, 4 x 2,000 gallon, 1 x 1,300 gallon, 1 x 1,200 gallon, 3 x 750 gallon, 1 x 650 gallon, and 4 x 500 gallon.
- Storage Tanks one through five – five carbon steel tanks with 5,000-gallon capacity per tank.

The combined storage capacity of the 27 tanks present at the facility in 1990 was 109,400 gallons. Storage tanks A through F were arranged in an L-shaped pattern in the southern corner of the property. Storage tanks one through five were located in the northern yard, and were arranged in a linear pattern along the side of the warehouse. The locations of the smaller storage tanks were not indicated in the Operation Plan. According to the Operation Plan, the 5,000 and 10,000 gallon storage tanks were used to store solvent wastes prior to distillation. Distillation units had a total treatment capacity of 1,500 gallons per hour. The wiped film evaporation units had a design treatment capacity of 200 gallons per hour.

2.3 Surrounding Properties

Investigations of the three properties immediately adjoining the former Omega Chemical property (Skateland, Terra Pave, and the Medlin & Son South Building (formerly Cal-Air) were included in the *OSS RI/FS Work Plan* (CDM, September 29,

2003). Based upon analytical results of samples collected from these adjoining properties, the investigation was expanded to include four additional nearby properties: the Medlin & Son North Building, L.A. Carts, Oncology Care Medical Associates, and the Bishop Company. The surrounding properties are discussed below.

2.3.1 Former Skateland

Former Skateland was located at 12520 Whittier Boulevard, adjacent to the southeastern boundary of the former Omega Chemical property. The property consisted of an indoor roller-skating rink that was in operation until OPOG purchased the property on October 1, 2006. Review of the aerial photographs indicates that the property was used for agricultural purposes during 1946. The building presently occupying the property was observed on the 1956 photo. There were no environmental documents or reports available for review for the Skateland property.

Analysis of indoor air samples collected from the former Skateland property resulted in substantial additions to the RI scope of work and, ultimately, the purchase of the property. The initial scope of work consisted of indoor air and soil vapor sampling to assess potential migration of soil vapor in May 2004. In order to assist with evaluation of the sampling results, a chemical usage survey was also performed in May 2004. Evaluation of the HVAC system in July 2004 indicated that the unit re-circulated air inadequately, at a rate slower than one air exchange per hour. Acetone-based deodorizers were observed during the HVAC survey, which could have affected the May 2004 indoor air sampling results. However, the deodorizers apparently did not contain any of the chemicals of concern (tetrachloroethene [PCE], trichloroethene [TCE], and 1,1-dichloroethene [DCE]) that were detected in the indoor air samples. With the exhaust fans operational and the deodorizers turned off, indoor air samples were collected again in August 2004. Evaluation of the indoor air samples indicated that soil vapors were likely migrating into the building, possibly via the utility corridors.

Additional tasks were proposed to evaluate indoor air quality in an *Addendum to the OSS RI/FS Work Plan* (CDM, October 20, 2004). Soil vapor sampling was conducted at the former Skateland facility along the utility corridors and around the building in November 2004 and the results and preliminary findings were submitted to USEPA in the *Preliminary Evaluation of Soil Gas Results from November 2004* (CDM, February 3, 2004). Air purifiers were installed in the boys and girls restrooms and kitchen during December 2004. Indoor air quality samples were collected immediately before the purifiers were placed into operation and shortly after, in order to evaluate their effectiveness. CDM conducted SSD testing in September 2005, and submitted a *Skateland SubSlab Depressurization Testing Technical Memorandum* of the findings (CDM, December 6, 2005). CDM conducted a second SSD test to determine whether the concrete masonry unit dividing the rink and party/arcade area was acting as a vapor barrier (CDM, December 16, 2005).

On April 6, 2006, USEPA issued a *Request for a Removal Action* to mitigate vapor migration into the Skateland building (USEPA, April 6, 2006). OPOG entered into an amendment to the Consent Decree and Supplemental Statement of Work to either mitigate the vapor migration or conduct an Alternate Response Action such as purchasing the property and closing the Skateland operation., OPOG elected to conduct an Alternate Response Action by purchasing the property and closing Skateland on October 1, 2006. The former Skateland building was demolished in March and April 2007.

This report summarizes all the testing procedures, results, and risk evaluation performed at the former Skateland facility. Several technical memoranda have been prepared regarding the indoor air and soil vapor sampling efforts conducted in or near the former Skateland facility (CDM, October 20, 2004 and November 30, 2004, and December 16, 2005).

2.3.2 LA Carts Manufacturing

LA Carts is located at 12549 East Washington Boulevard, a short distance south of Skateland. LA Carts manufactures portable food carts, most of which are fabricated from stainless steel sheeting. The LA Carts property is occupied by a 2,000 square foot, one-level building and exterior lot. There is also a smaller (1,500 square feet) shop building in the rear of the property which is open and does not have any doors. The front of the larger building contains two small offices and a reception area. The rear fabrication area comprises the majority of the building. Two large roll-up doors at the rear of the fabrication area were open to the outside, and appeared inoperable. The food carts are assembled in the exterior paved lot. The LA Carts facility was evaluated for HVAC performance, chemical use, and indoor air quality.

2.3.3 Oncology Care Medical Associates

Oncology Care is located at 12535 E. Washington Boulevard., at the northeast corner of Putnam Street and Washington Boulevard. Oncology Care is housed in a 3,720 square foot, U-shaped, one level building, with an exterior paved parking lot. The building has a reception/waiting area in the front, with offices, examination rooms, a medicine storage/mixing room, and treatment room occupying the remainder of the building. Similar to the LA Carts facility, the Oncology Care facility was evaluated for HVAC performance, chemical use, and indoor air quality.

2.3.4 Bishop Company

The Bishop Company is located at 12519 E. Putnam Street, south-southwest of the former Omega Chemical property. The facility consists of a medium-sized two story building and a large warehouse. The two-story building houses a reception area and office space on the ground floor, with individual offices and a break room on the second floor. Within the warehouse is a self-contained sales room (approximately 1,600 square feet), complete with ceiling and AC unit. The AC unit servicing the sales room is approximately 15 years old and near the end of its service life. It re-circulates

chilled air, and does not have an intake for outside air. There is a fairly new AC unit on the roof of the two-story office, which also does not have an outside air intake.

Similar to the LA Carts and Oncology Care facilities, the Bishop Company facility was evaluated for HVAC performance chemical use, and indoor air quality. Two vapor and MIP borings were drilled near the Bishop property to evaluate the migration of subsurface contaminants to this facility.

2.3.5 Terra Pave

The Terra Pave, Inc. facility is located at 12511 East Putnam Street, adjacent to the southwestern boundary of the former Omega Chemical property. The southeastern part of the Terra Pave facility is leased by Dick Madsen Roofing. The DSR (CDM, December 4, 2001) reviewed a Phase 1 Environmental Site Assessment (ESA) for information regarding historical activities at the Terra Pave property (Cardinal Environmental Consultants [Cardinal], 1991).

The Phase I ESA Report was prepared for the New England Lead Burning Company (NELCO), which operated the Terra Pave property beginning in the mid-1950s. According to the Phase I ESA, the property was unoccupied during a September 1991 site visit by Cardinal staff. The Phase I ESA indicated that NELCO purchased lead in sheet, pipe and solid rods and fabricated the desired product by burning (welding) the lead to the required shape. The welding was performed in the building located along the northeastern portion of the property (Building two), adjacent to the former Omega Chemical property. The type of work performed in the remaining building (Building one) was primarily carpentry work and did not involve lead welding. Building one was also used for offices and warehousing. The exterior of the property was used for storage of equipment and loading materials or finished goods for shipment. The report noted that the undeveloped portions of the property consisted of exposed soil and miscellaneous rubble. Drainage patterns incised in the soil were observed trending in a southerly direction towards Putnam Street.

The Phase I ESA briefly discussed the findings of environmental investigations performed between 1989 and 1991 to evaluate the property for the presence of residual lead. To mitigate this concern, NELCO subcontracted Vector Three Environmental Inc. of Brea, California, to clean the interior of all facilities and remove superficial lead from the topsoil. Removal activities were monitored by Cardinal staff and they indicated that remaining lead levels were extremely low, based on results of confirmatory dust wipe and soil samples. Information regarding lead levels prior to and after removal activities and the depth of the soils removal was not provided. The building where lead welding took place is located directly adjacent to the former Omega Chemical property, and lead welding occurred prior to the time when the former Omega Chemical property was paved. It is possible that lead in airborne particulates from the Terra Pave facility was deposited onto surface soils of the former Omega Chemical property.

CDM implemented the Phase 1a field investigation during June and July 1999 to evaluate the extent of groundwater contamination at and immediately downgradient of the former Omega Chemical property. As part of the Phase 1a field investigation, monitoring well OW-1b was installed on Terra Pave property. Analysis of soil samples collected during the drilling of this monitoring well indicated the presence of VOC contamination in the vadose zone. PCE was the compound most frequently detected in soil samples collected from monitoring well OW-1b; PCE concentrations ranged from 4.7 micrograms per kilogram ($\mu\text{g}/\text{kg}$) at a depth of 120 feet bgs to 3,300 $\mu\text{g}/\text{kg}$ at a depth of 70 feet bgs.

Several activities were conducted to evaluate the potential migration of VOCs to this neighboring property for this RI. Similar to the former Skateland facility, indoor air samples were analyzed for VOCs and a chemical use survey was conducted to evaluate the influence of VOC-containing materials used in the building on the indoor air analytical results. Several soil, MIP, and soil vapor borings were conducted.

2.3.6 Medlin & Son North Building

The Medlin & Son North Building is located at 12476 East Whittier Boulevard. The building is a one-level, approximately 3,000-square foot building which contains a laser operated metal cutting machine, laser gases, and miscellaneous shelving for various metal stock. A large covered shed is attached to the rear of the building. There are several small interior offices that are used for storage.

An HVAC system assessment and chemical use survey were conducted at this facility. One indoor air sample was collected from this building during the most recent sampling event conducted in September 2006.

2.3.7 Medlin & Son South Building (Former Cal-Air Facility)

The former Cal-Air facility, now owned and operated by Medlin & Son, is located at 12484 Whittier Boulevard, adjacent to the northwestern boundary of the former Omega Chemical property. The DSR reviewed a Phase I ESA prepared by Centec Engineering (Centec, 1997) for information regarding the former Cal-Air property. The report was prepared for Maple Brothers Industrial, Inc. According to the report, a machine shop and office were constructed at the property in 1954. The property was occupied by Accessory Products, Inc. until approximately early 1976. In September 1976, Cal-Air Conditioning Company added three new offices and occupied the property until 1996. The building on the property consists of a conglomeration of structural types, representing many additions and expansions during the years the property was occupied. A below-grade room and "test tunnel" is reportedly located along the southern side of the building. According to a City Building Department document, the test tunnel was to be used for non-hazardous test work on government projects. At the time of the assessment, the property was unoccupied and access to the test tunnel access was blocked by a heavy metal door and a large amount of water in the vault of the front entrance.

In October 1987, four USTs that used to contain gasoline and diesel fuels were removed from the property by Toxguard Systems, Inc. Laboratory analytical results indicated 72 parts per million (ppm) of hydrocarbons in one of the soil samples collected from under the USTs, with no detectable concentrations in the remaining seven samples submitted for analysis. The Phase I ESA noted significant surficial staining on the wall and floor in the extreme northwest portion of the warehouse.

2.4 Physical Setting

2.4.1 Climate

The climate of the area is characterized as semi-arid, with an average annual precipitation of approximately 16 inches. Precipitation occurs mainly during the winter and spring months.

2.4.2 Surface Topography

The land surface at the former Omega Chemical property slopes to the southwest to south-southwest at approximately 0.016 feet per foot, and is situated at approximately 220 feet above mean sea level (msl).

2.4.3 Regional Geology and Hydrogeology

The Site is located in the Montebello Forebay area of the Central Groundwater Basin of the Coastal Plain of Los Angeles (California Department of Water Resources [DWR], 1961). The Montebello Forebay is an important area of groundwater recharge. Groundwater flow in the area is generally towards the southwest, originating in an area of recharge and flowing toward an area of discharge.

The Site is underlain by low permeability silty and clayey soils of the upper Pleistocene Lakewood Formation. The Bellflower aquiclude (the Bellflower unit is actually more accurately described as an aquitard) is part of the undifferentiated Lakewood formation throughout much of the Whittier area, and likely underlies the Site. The Lakewood Formation is locally derived from erosion of the Puente Hills to the northeast, and may be overlain by a thin cover of Holocene slopewash and alluvium that can be difficult to distinguish from the Lakewood Formation on the basis of lithology. Furthermore, local merging and interfingering of geologic units near the basin margin makes positive identification of individual geologic units encountered in borings problematic.

The direction of regional groundwater flow is generally to the southwest. The nearest active downgradient water supply wells are located more than one mile from the former Omega Chemical property. The closest active well (well 30R3) is located on Dice Road by Burke Street, approximately 1.25 miles downgradient of the former Omega Chemical property. This well is screened from 200 to 900 feet bgs and at least two aquitards appear to be present between the shallowest aquifer and the top of the well screen.

2.4.4 Local Geology and Hydrogeology

This discussion of local geology and hydrogeology is based on an evaluation of lithologic logs, soil conductivity, and geophysical borehole data from borings advanced at the Site. It is necessary to understand the nature of subsurface materials underlying the Site to gain an understanding of contaminant migratory pathways. Therefore, detailed descriptions of subsurface materials noted at the Site are provided below.

Figures 2-2 through 2-6 show geologic cross-sections of the Site. In the vicinity of the former Omega Chemical property, groundwater is typically encountered between 70 and 80 feet bgs, and flows to the southwest. The lithologic and MIP logs used for construction of the cross-sections are included on a compact disc which is provided in Appendix A.

Regional hydrogeologic information is inconclusive on the presence or absence of major regional named aquifers in this portion of the Whittier Area. A cross-section about 1.5 miles south of the former Omega Chemical property is presented in Bulletin 104 (DWR, 1961) that suggests that the uppermost aquifers present are the Gage and Jefferson Aquifers. The upper portion of the shallow aquifer may represent the Gage aquifer, while the lower aquifer is potentially the Hollydale or Jefferson aquifer. The Gage aquifer is the major water bearing member of the Lakewood formation in the Whittier area, where it consists of about 30 feet of sand with some interbedded clay. It can attain maximum depths of 150 feet. The Jefferson aquifer is part of the Lower Pleistocene San Pedro formation that underlies the entire Whittier Area. The formation is composed of sand and gravel with interbedded clay, likely of marine origin. It ranges in thickness from 20 to 40 feet and reaches a maximum depth of 350 feet.

Below the Gage and Jefferson aquifers are deeper members of the Lower Pleistocene San Pedro formation. From shallowest to deepest, they are the Hollydale, Lynwood, Silverado, and Sunnyside aquifers. The Hollydale aquifer may be located beneath the Site, as the Site is located in the western part of the Whittier Area. It ranges in thickness from 10 to 25 feet and reaches to a maximum depth of 100 feet, and merges with the overlying Gage near South Whittier. The Lynwood aquifer ranges in thickness from 50 to 100 feet and extends to a maximum depth of 460 feet; the Silverado aquifer ranges in thickness from 110 to 300 feet, and extends to a depth of 750 feet; while the Sunnyside aquifer consists of 200 to 300 feet of sand and gravel and reaches a depth of 1,000 feet. Site borings have not penetrated any of these deeper formations.

Vadose Zone

The vadose zone has been characterized by a combination of soil borings and a MIP investigation. It is generally comprised of clayey silts with occasional sand lenses. The shallower interbedded silty clays and clays are characterized by alternating layers of high and low soil conductivity materials. Corroborating the MIP conductivity findings are the continuous soil boring logs, which show fine grained materials

(silts, silty clays, clays, corresponding to higher conductivity) with occasional thin lenses of fine sand (lower conductivity).

An important lithologic layer starting at an approximate depth of 30 feet bgs (hereinafter referred to as the 30-foot unit) was found dipping to the west and southwest. The 30-foot unit has a characteristic double peak signature on the MIP conductivity logs, with a lower conductivity interbed in the middle of the unit likely consisting of siltier materials. Nearly all borings show a 1- to 4-foot thick unit with lower conductance, interpreted to be a sandy to silty lithology with less clay overlying the marker bed. The "30-foot zone" itself is between 3.5 to 11 feet thick. The top of the zone slopes generally to the west-southwest with a southwesterly trough directly beneath the center of the Site (Figure 2-7). It should be noted that the configuration of the surface in the area of the northernmost data point (MIP25) has limited control, and that this point appears to be an outlier distorting the slope contours. The "30-foot zone" appears to be an important factor in contaminant fate and transport at the Site, which will be further discussed in Section 5.

Saturated Zone

Groundwater investigations performed to date have indicated the presence of the two aquifer zones present at the Site, separated by a low permeability confining zone. The first sandy zone is encountered near the first occurrence of groundwater. It originates a short distance southwest of the former Omega Chemical property and thickens dramatically to the west (cross-sections C-C' and D-D', Figures 2-5 and 2-6). MIP borings and soil borings advanced at the former Omega Chemical property indicate that the sandy unit does not exist beneath the former Omega Chemical property. The sandy unit was observed in borings along Putnam Street (west of the former Omega Chemical property) and is up to 35 feet thick at downgradient well OW-4/4B. In the MIP borings at the western edge of the former Omega Chemical property, the sandy zone is characterized by low conductivity between 45 and 60 feet bgs. The unit is characterized by fine to medium sands.

The shallow unconfined aquifer may also thin toward the north as shown by cross-section A-A' along Putnam Street, which is perpendicular to the general flow direction (Figure 2-3). This cross-section incorporates boring logs for wells and borings advanced by OPOG, as well as logs available in USEPA files for other sites. The shallow aquifer configuration shows the presence of a lower permeability zone splitting the upper aquifer north of PZ1. Data from boring B-4 suggests that the lower permeability split was eroded or never deposited, or that this older boring was logged at intervals that may have skipped this thin lower permeability zone. The uppermost sand unit within the upper aquifer appears continuous below the water table elevation from H-7 at the northern end to EW-5 at the southern end of the section.

Based on water levels at the OW4 and OW8 locations, where both deep and shallow zone completions are available, the groundwater elevations are significantly higher in the shallow aquifer. A similar difference in water level, with an indicated downward

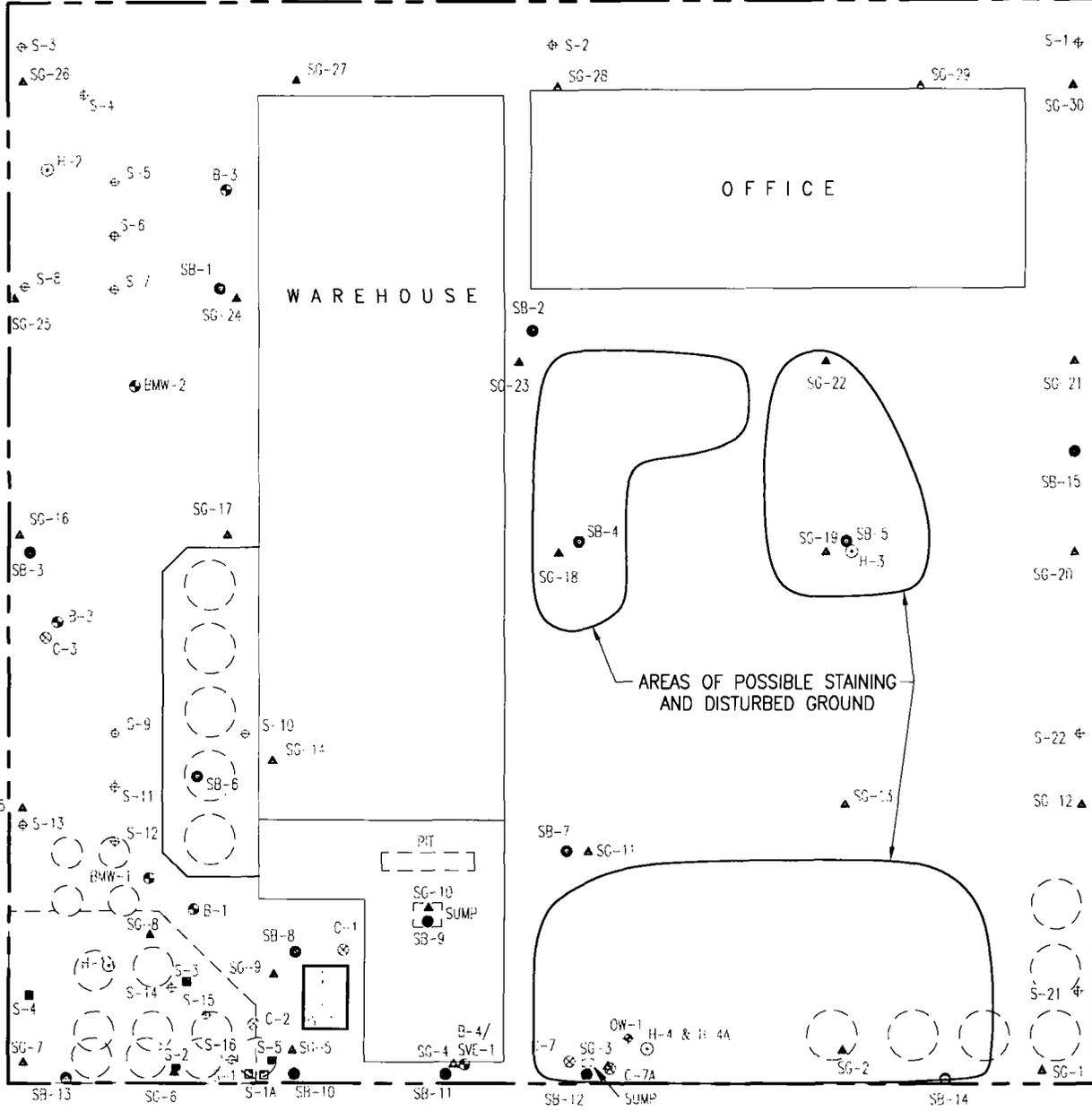
gradient, was observed at the cluster at OW1/1b. This indicates that a significant confining zone limits flow between these zones.

Similar to the shallower unconfined aquifer, the deeper confined aquifer may also thin under the former Omega Chemical property and thicken to the west. Only the deeper wells to the west penetrate into this unit; it was not observed at well OW-1B at Terra Pave. The deeper confined aquifer is characterized by sand with some silt.

Groundwater Flow and Aquifer Characteristics

Groundwater flow in the upper aquifer has been consistently towards the southwest based on depth to water and groundwater elevation data collected and contour maps prepared since mid-2001. Numerous aquifer tests have been performed on Omega wells over the past 7 years, as follows: slug tests and step-drawdown testing on wells OW-1b, OW-2, and OW-3 in 1999; short-term (approximately 4 hours) constant discharge testing on wells OW-2, OW-3, OW4a, and OW8 in 2003; and more recently approximately 24-hours of constant discharge testing performed in September 2006 on five wells installed in mid-2006 (EW-1 through EW-5) that are proposed for groundwater extraction as part of the Phase 1a area groundwater remedy. A technical memorandum detailing testing procedures and an evaluation of the testing results was prepared and submitted to USEPA in late-2006 (CDM, November 7, 2006).

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 DWG: C:\Documents and Settings\nguyens\Desktop\Omega\00-sheets\PSA0-HistPhot.dwg



LEGEND

- Leroy Crandall Soil Boring (1985)
- ENSR Soil Boring (1988)
- ⊕ ENSR Groundwater Monitoring Well (1988)
- England/Hargis Soil Boring (January 1996)
- ▲ England/Hargis Soil Gas Sample (December 1995)
- ⊕ England/Hargis Monitoring Well (June 1996)
- ⊙ England/Hargis Hydropunch (March 1996)
- ⊗ England/Hargis Soil Boring (March 1996)
- ⊕ ERT Soil Gas Sample (1988)
- Feature Removed

□ Former 500 Gallon UST Location

Note: All locations approximate.

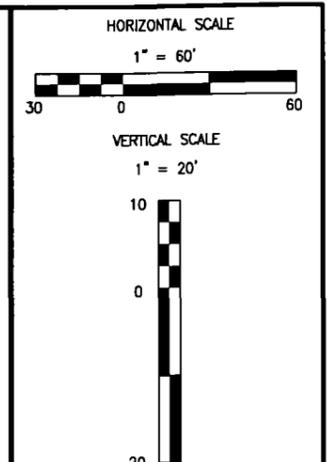
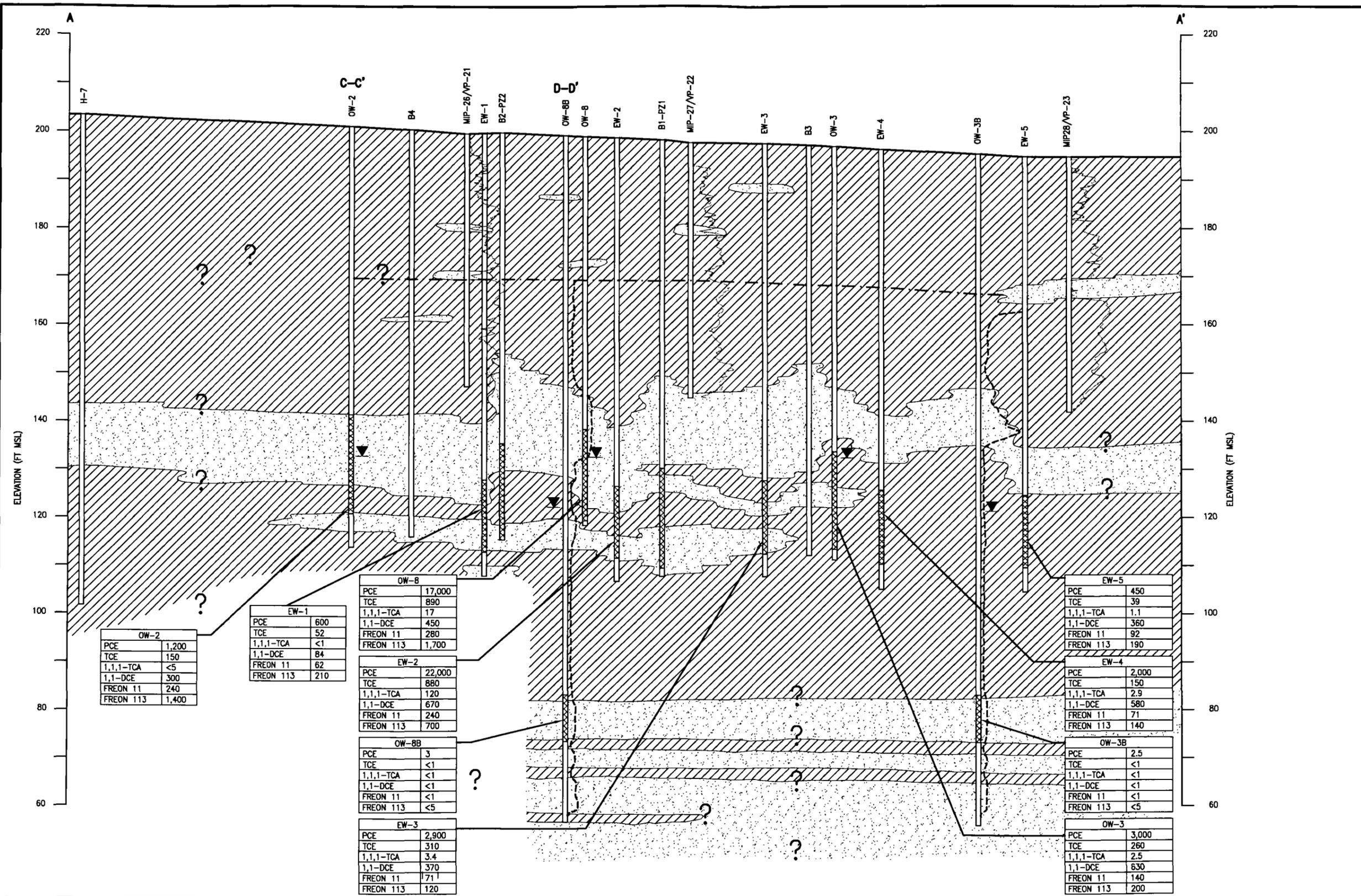
OMEGA CHEMICAL

Potential Source Areas And Historic Sample Locations



Figure 2-1

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- LEGEND**
- FT MSL FEET ABOVE MEAN SEA LEVEL
 - GROUND SURFACE
 - - - RESISTIVITY LATEROLOG
 - · - · TOP OF 30 FT UNIT
 - MEMBRANE INTERFACE PROBE
 - SOIL CONDUCTIVITY PROFILE
 - [Stippled pattern] SAND/SILTY SAND
 - [Diagonal hatching] SILT/CLAY
 - ▼ STATIC WATER LEVEL AUGUST 2006
 - [Dashed box] SCREENED INTERVAL

NOTES

GROUNDWATER SAMPLES COLLECTED AUGUST & SEPTEMBER 2006

CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER LITER (UG/L)

MIP-26/VP-21/B-6 WAS PROJECTED ONTO THE CROSS SECTION LINE

LITHOLOGY AT MIP LOCATION AND TOP OF 30 FOOT UNIT BASED ON INTERPRETATION OF SOIL CONDUCTIVITY LOG

PCE = TETRACHLOROETHENE
TCE = TRICHLOROETHENE
TCA = TRICHLOROETHANE
DCE = DICHLOROETHENE
FREON 11 = TRICHLOROFUOROMETHANE
FREON113 = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

OW-8	
PCE	17,000
TCE	890
1,1,1-TCA	17
1,1-DCE	450
FREON 11	280
FREON 113	1,700

EW-1	
PCE	600
TCE	52
1,1,1-TCA	<1
1,1-DCE	B4
FREON 11	62
FREON 113	210

EW-2	
PCE	22,000
TCE	880
1,1,1-TCA	120
1,1-DCE	670
FREON 11	240
FREON 113	700

OW-8B	
PCE	3
TCE	<1
1,1,1-TCA	<1
1,1-DCE	<1
FREON 11	<1
FREON 113	<5

EW-3	
PCE	2,900
TCE	310
1,1,1-TCA	3.4
1,1-DCE	370
FREON 11	171
FREON 113	120

EW-5	
PCE	450
TCE	39
1,1,1-TCA	1.1
1,1-DCE	360
FREON 11	92
FREON 113	190

EW-4	
PCE	2,000
TCE	150
1,1,1-TCA	2.9
1,1-DCE	580
FREON 11	71
FREON 113	140

OW-3B	
PCE	2.5
TCE	<1
1,1,1-TCA	<1
1,1-DCE	<1
FREON 11	<1
FREON 113	<5

OW-3	
PCE	3,000
TCE	260
1,1,1-TCA	2.5
1,1-DCE	630
FREON 11	140
FREON 113	200

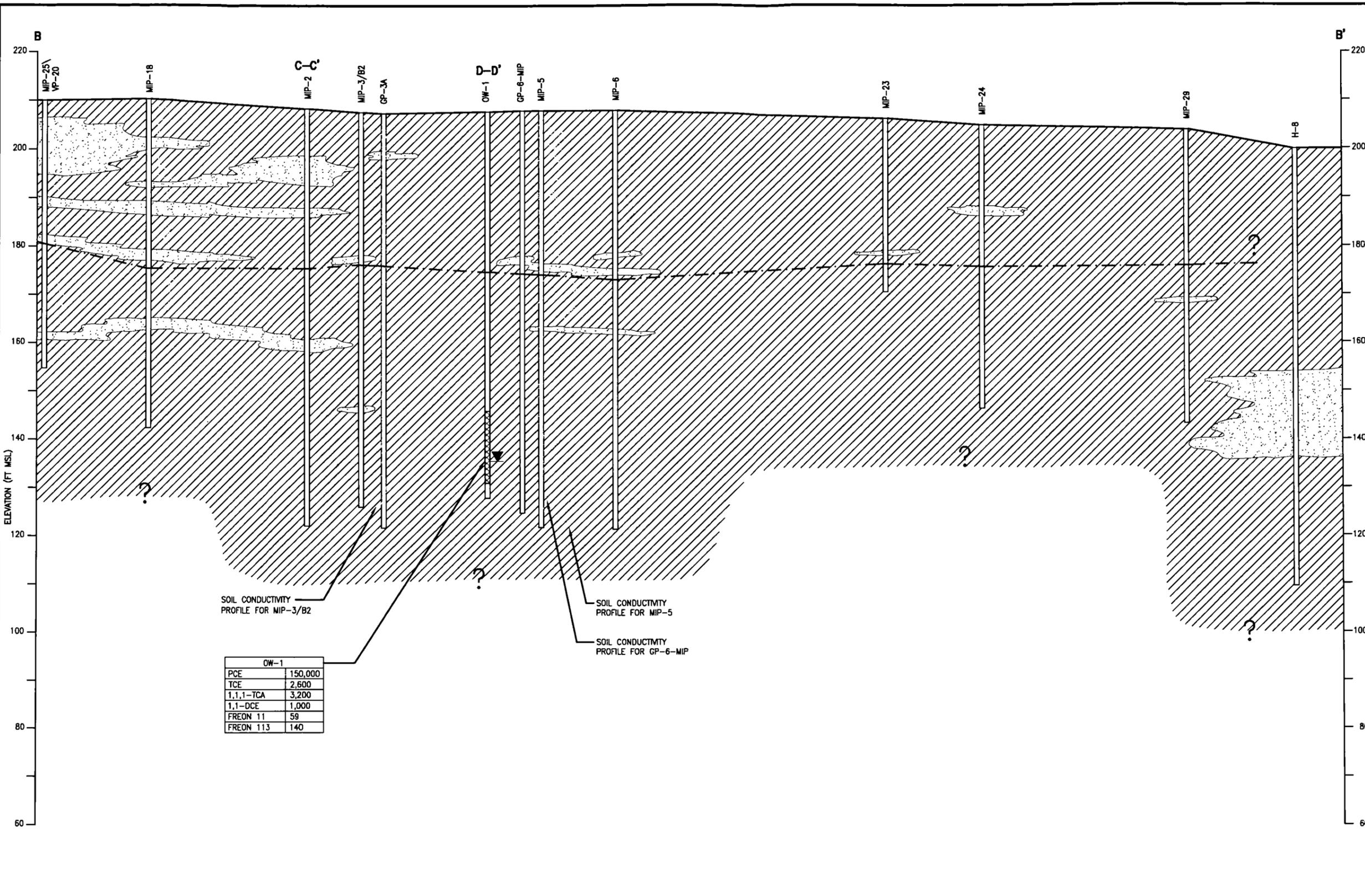
OMEGA CHEMICAL

GENERALIZED CROSS-SECTION A-A'

FIGURE 2-3



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 DWG: C:\King City\ACAD2000\10500 moved to belvue\37240\Omega-Cross-Sections\section b-b.dwg
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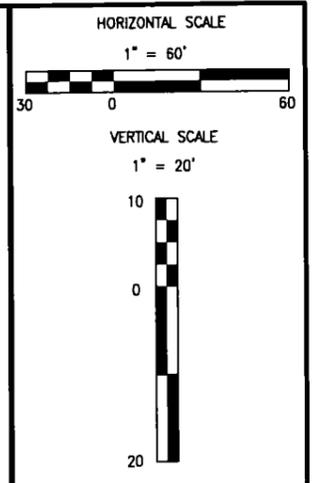


SOIL CONDUCTIVITY PROFILE FOR MIP-3/B2

SOIL CONDUCTIVITY PROFILE FOR MIP-5

SOIL CONDUCTIVITY PROFILE FOR GP-6-MIP

OW-1	
PCE	150,000
TCE	2,600
1,1,1-TCA	3,200
1,1-DCE	1,000
FREON 11	59
FREON 113	140



- LEGEND**
- FT MSL FEET ABOVE MEAN SEA LEVEL
 - GROUND SURFACE
 - - - TOP OF 30 FT CLAY UNIT
 - MEMBRANE INTERFACE PROBE SOIL CONDUCTIVITY PROFILE
 - SAND/SILTY SAND
 - SILT/CLAY
 - ▼ STATIC WATER LEVEL AUGUST 2006
 - SCREENED INTERVAL

NOTES

GROUNDWATER SAMPLES COLLECTED AUGUST & SEPTEMBER 2006

CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER LITER (UG/L)

LITHOLOGY AT MIP LOCATION AND TOP 30 FOOT UNIT BASED ON INTERPRETATION OF SOIL CONDUCTIVITY LOG

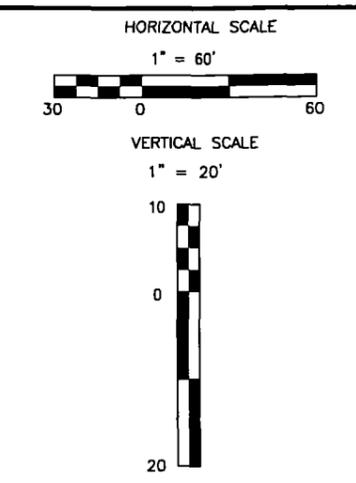
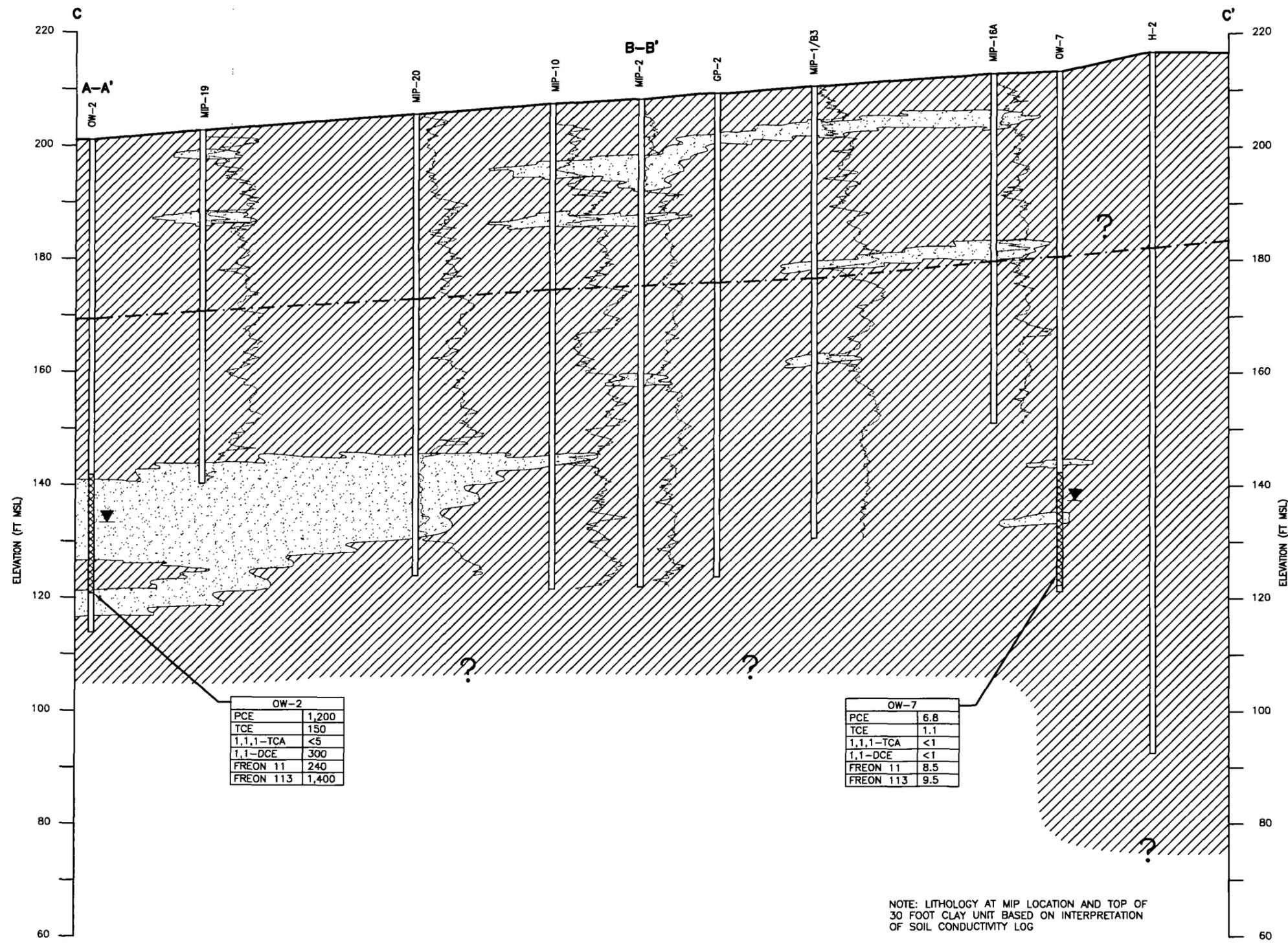
PCE = TETRACHLOROETHENE
 TCE = TRICHLOROETHENE
 TCA = TRICHLOROETHANE
 DCE = DICHLOROETHENE
 FREON 11 = TRICHLOROFLUOROMETHANE
 FREON 113 = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

OMEGA CHEMICAL

GENERALIZED CROSS-SECTION B-B'

FIGURE 2-4





- LEGEND**
- FT MSL FEET ABOVE MEAN SEA LEVEL
 - GROUND SURFACE
 - - - TOP OF 30 FT CLAY UNIT
 - MEMBRANE INTERFACE PROBE SOIL CONDUCTIVITY PROFILE
 - [Stippled pattern] SAND/SILTY SAND
 - [Diagonal hatching] SILT/CLAY
 - ▼ STATIC WATER LEVEL AUGUST 2006
 - [Screened interval symbol] SCREENED INTERVAL

- NOTES**
- GROUNDWATER SAMPLES COLLECTED AUGUST & SEPTEMBER 2006
- CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER LITER (UG/L)
- PCE = TETRACHLOROETHENE
 - TCE = TRICHLOROETHENE
 - TCA = TRICHLOROETHANE
 - DCE = DICHLOROETHENE
 - FREON 11 = TRICHLOROFLUOROMETHANE
 - FREON113 = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

NOTE: LITHOLOGY AT MIP LOCATION AND TOP OF 30 FOOT CLAY UNIT BASED ON INTERPRETATION OF SOIL CONDUCTIVITY LOG

OMEGA CHEMICAL

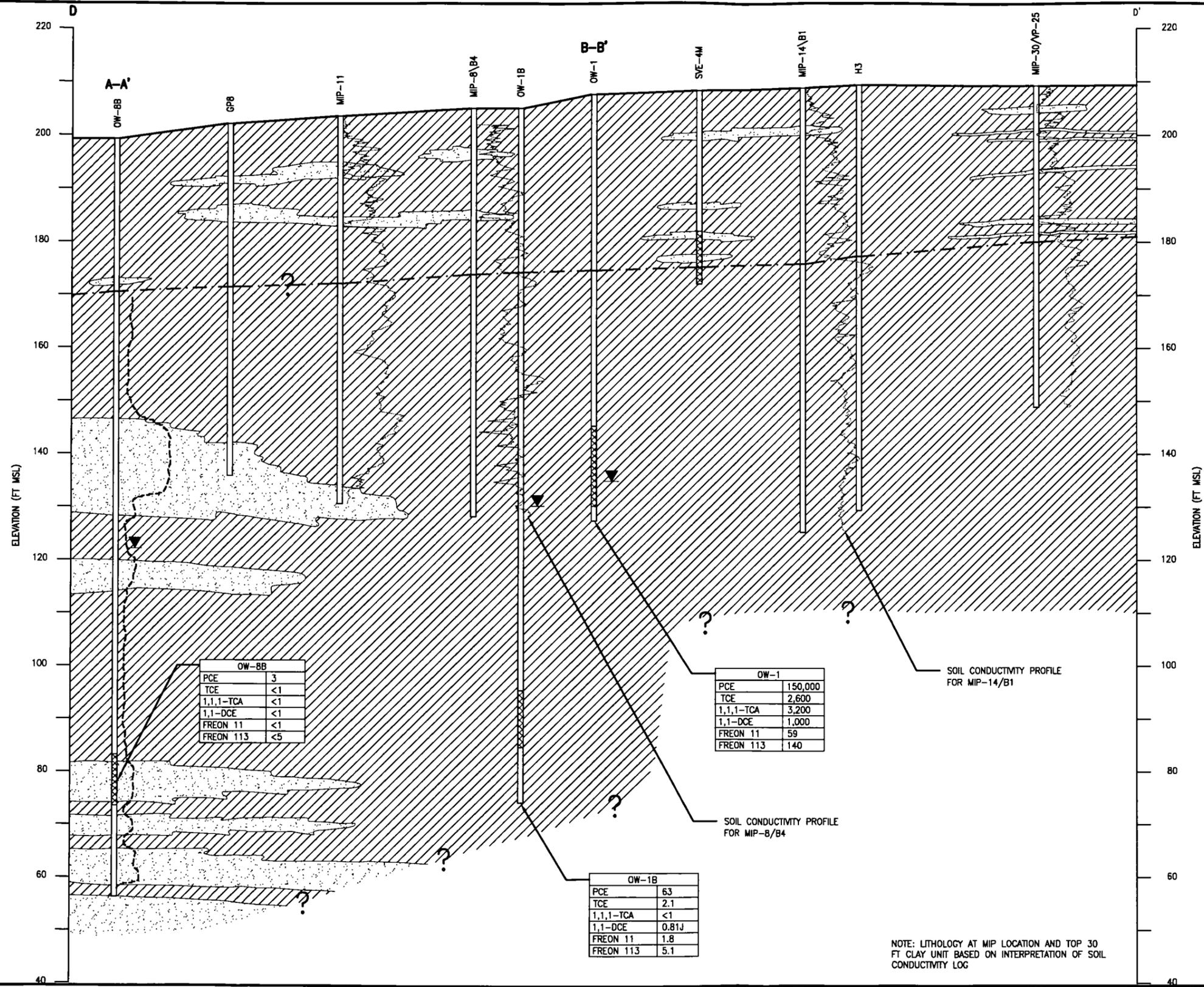
GENERALIZED CROSS-SECTION C-C'

FIGURE 2-5

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DATE: Jan 18, 2007 1:18pm XREFS: \\wiscsvr1\cad\ACAD\2000\10500\37240\Omega-Cross-Sections\section d-d'.dwg USER: nguyens

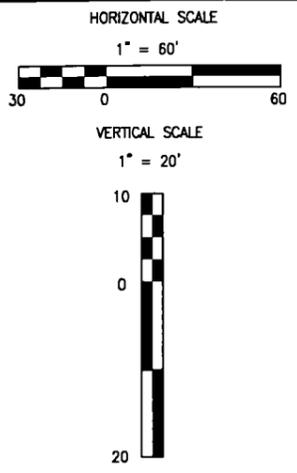


OW-BB	
PCE	3
TCE	<1
1,1,1-TCA	<1
1,1-DCE	<1
FREON 11	<1
FREON 113	<5

OW-1	
PCE	150,000
TCE	2,600
1,1,1-TCA	3,200
1,1-DCE	1,000
FREON 11	59
FREON 113	140

OW-1B	
PCE	63
TCE	2.1
1,1,1-TCA	<1
1,1-DCE	0.81J
FREON 11	1.8
FREON 113	5.1

NOTE: LITHOLOGY AT MIP LOCATION AND TOP 30 FT CLAY UNIT BASED ON INTERPRETATION OF SOIL CONDUCTIVITY LOG



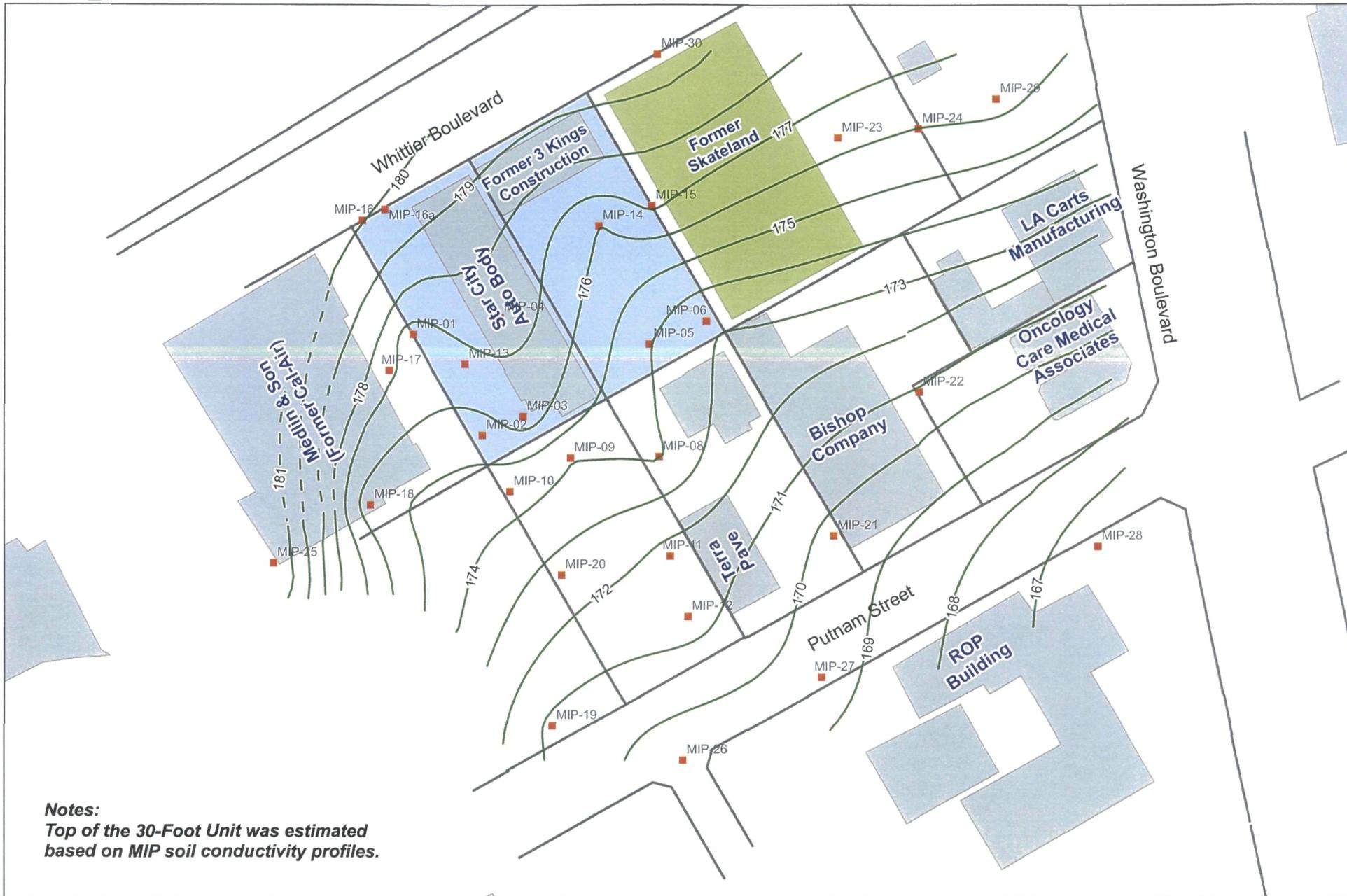
- LEGEND**
- FT MSL FEET ABOVE MEAN SEA LEVEL
 - GROUND SURFACE
 - - - RESISTIVITY LATEROLOG
 - · - · - TOP OF 30 FT CLAY UNIT
 - MEMBRANE INTERFACE PROBE SOIL CONDUCTIVITY PROFILE
 - [Stippled pattern] SAND/SILTY SAND
 - [Diagonal hatching] SILT/CLAY
 - ▼ STATIC WATER LEVEL AUGUST 2006
 - [Screened interval symbol] SCREENED INTERVAL

- NOTES**
- GROUNDWATER SAMPLES COLLECTED AUGUST & SEPTEMBER 2006
- CONCENTRATIONS ARE REPORTED IN MICROGRAMS PER LITER (UG/L)
- PCE = TETRACHLOROETHENE
 - TCE = TRICHLOROETHENE
 - TCA = TRICHLOROETHANE
 - DCE = DICHLOROETHENE
 - FREON 11 = TRICHLOROFLUOROMETHANE
 - FREON 113 = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE



OMEGA CHEMICAL
GENERALIZED CROSS-SECTION D-D'

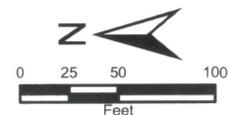
FIGURE 2-6



Notes:
 Top of the 30-Foot Unit was estimated based on MIP soil conductivity profiles.

Legend

- Property Boundary
- Former Omega Chemical Property
- Existing Building
- Former Building
- Iso-elevation Contour, Top of 30' Unit (ftMSL) [Dashed where inferred]
- MIP Location



Omega Chemical
 Elevation
 Top of 30- Foot Unit

Figure 2-7