DRAFT ANNUAL OPERATIONS REPORT 2007

For The Pemaco Remedial Action

PEMACO SUPERFUND SITE
5050 E. Slauson Avenue
Maywood, California

Prepared for:

U.S. Environmental Protection Agency
Region IX
San Francisco, California

U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

Prepared by:

T N & Associates, Inc.
Engineering and Science
317 E. Main Street
Ventura, California 93001

January 2008

DRAFT ANNUAL OPERATIONS REPORT 2007

For

PEMACO SUPERFUND SITE
MAYWOOD, CALIFORNIA

Prepared for
U.S. Environmental Protection Agency – Region IX
San Francisco, California

U.S. Army Corps of Engineers – Omaha District
Omaha, Nebraska

January 2008

Signature: ______________________________ ______
Timothy P. Garvey Date
TN&A Project Manager

Signature: ______________________________ ______
John Wingate, PE Date
TN&A Project QC Manager/Project Engineer

Signature: ______________________________ ______
Dacre Bush Date
TN&A Project QC Manager/Senior Remediation Specialist

Signature: ______________________________ ______
Angela Smith, M.Sc. Date
TN&A Project Environmental Engineer

T N & Associates, Inc.
Engineering and Science

317 E. Main Street

Ventura, CA 93001

EXECUTIVE SUMMARY

This Annual Operations Report (AOR) 2007 has been prepared by T N & Associates, Inc. (TN&A) under the U. S. Army Corps of Engineers (USACE) contract DACA# 4500-D-0066 for the Pemaco Superfund Site Remedial Action to summarize operation and maintenance activities conducted at the vapor and groundwater treatment plant as well as to report on the treatment system performance at the Pemaco Superfund Site (the Site) in Maywood, California. The USACE, Omaha District provides contract management and construction oversight for the United States Environmental Protection Agency (EPA).

The remedial action being implemented according to the Record of Decision (ROD) for the Pemaco Superfund Site dated January 13, 2005 (EPA, 2005) consists of dual-phase extraction (DPE), groundwater extraction, and soil vapor extraction processes. These processes remove volatile organic compounds (VOCs), namely trichloroethene (TCE), from the subsurface. Electrical resistance heating (ERH) is also being used in the source area (the area with the highest TCE concentrations) to expedite the remediation process, which is anticipated to take 5 years. The AOR 2007 focuses on the treatment system performance as the details regarding ERH will be the subject of a separate report. This report covers two (2) phases of the planned remedial action, as described in the Final Design Report (TN&A, 2006):

- Phase I: commissioning and startup of the groundwater (April 25, 2007) and vapor (May 4, 2007) extraction and treatment systems,
- Phase II: operation and maintenance (O&M) of the vapor and groundwater extraction and treatment system during thermal treatment of the source area via ERH, which began on September 25, 2007, is currently underway.

In 2007, not one reportable incident occurred at the Site as a result of operations and TN&A employees successfully completed 17,967.5 incident-free hours. The operation of the vapor and groundwater treatment system was in 100% compliance with the applicable or relevant and appropriate requirements (ARARs) including both the South Coast Air Quality Management District's (SCAQMD's) vapor discharge guidance and the Sanitation District of Los Angeles County's (SDLAC's) sewer discharge permit.

System performance data is collected on a daily basis at the Site to ensure compliance with the discharge permits and to ensure the effective and safe operation of the treatment system. Key performance statistics for the operation of the vapor and groundwater treatment systems from April 25, 2007 through to December 31, 2007 are summarized below:

Treatment System:	Vapor	Groundwater	TOTAL
Total Mass of TCE Removed	197 pounds	26 pounds	223 pounds
Total Mass of VOCs Removed	12,736 pounds	47 pounds	12,783 pounds
Average TCE Removal Rate	0.88 lbs/day	0.08 lbs/day	0.96 lbs/day
Average VOC Removal Rate	56 lbs/day	0.14 lbs/day	56 lbs/day
Average Flow Rate	553 scfm	31 gpm	
Cumulative Volume Treated	176,696,475 scf	11,460,978 gallons	
Operating Time	4,314 hours	5,667 hours	
Percent Uptime	74%	94%	

Notes: gpm – gallons per minute; lbs/day – pounds per day; scf – standard cubic feet; scfm – standard cubic feet per minute

This AOR describes important elements of the treatment system operation, the optimization activities that were performed at the Site in 2007, and the performance of both the vapor and groundwater treatment systems.

TABLE OF CONTENTS

FIGURES

TABLES

TABLES CONTINUED

GRAPHS

APPENDICES

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
^{o}C	degree Celsius
^{o}F	degree Fahrenheit
AHA	Activity Hazard Analysis
AOR	Annual Operations Report
APP	Accident Prevention Plan
AST	above ground storage tank
BACT	Best Available Control Technology
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-1,2-DCE	*cis*-1,2-dichloroethene
CO	carbon monoxide
COCs	chemicals of concern
COD	chemical oxygen demand
DPE	dual-phase extraction
DRE	destruction and removal efficiency
dscm	dry standard cubic meter
EDD	electronic data deliverable
EDMS	Environmental Data Management System
EPA	United States Environmental Protection Agency
EPP	Environmental Protection Plan
ERH	electrical resistance heating
ERM	Environmental Resources Management, Inc.
FE	flow element
FTO	flameless thermal oxidizer
GAC	granular activated carbon
gpm	gallons per minute
HVDPE	high vacuum dual-phase extraction
ISMS	Integrated Safety Management System
J&H	Jacob & Hefner Associates
kWh	kilowatt hours
MCP	main control panel
mL	milliliter
MOMP	Management and Operation and Maintenance Plan
NCP	National Contingency Plan
NESHAP	National Emission Standard for Hazardous Air Pollutants
O&M	operation and maintenance
OSHA	Occupational Safety and Health Agency
PCDDs	polychlorinated dibenzodioxins
PCDFs	polydichlorinated dibenzofurans
PID	photo ionization detector
PLC	programmable logic controller
ppbv	part per billion by volume
ppm	part per million
ppmv	part per million by volume
PPE	personal protective equipment
QA/QC	quality assurance / quality control
RAO	remedial action objective

ACRONYMS AND ABBREVIATIONS CONTINUED

RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SCADA	system control and data acquisition
SCAQMD	South Coast Air Quality Management District
scf	standard cubic feet
scfm	standard cubic feet per minute
SDLAC	Sanitation District of Los Angeles County
SIM	selective ion mode
SMC	system main computer
SQL	Sequel Data Base
SSHP	Site Safety and Health Plan
SSRL	Site Specific Remediation Level
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TACs	toxic air contaminants
TCE	trichloroethene
TEQ	toxic equivalent
TICs	tentatively identified compounds
TMP	temperature monitoring probe
TN&A	T N & Associates, Inc.
TRS	Thermal Remediation Services, Inc.
TSS	total suspended solids
UPS	uninterruptable power supply
USACE	United States Army Corps of Engineers
UST	underground storage tank
VE	vapor extraction
VOAs	volatile organic analyte vials
VOC	volatile organic compound
VR	vapor recovery well

1.0 INTRODUCTION

This Annual Operations Report (AOR) 2007 has been prepared by T N & Associates, Inc. (TN&A) under the U. S. Army Corps of Engineers (USACE) contract DACA# 4500-D-0066 for the Pemaco Superfund Site Remedial Action to summarize operation and maintenance activities conducted at the vapor and groundwater treatment plant as well as to report on the treatment system performance at the Pemaco Superfund Site (the Site) in Maywood, California (Figure 1.1). The USACE, Omaha District provides contract management and construction oversight for the United States Environmental Protection Agency (EPA).

The remedial action is being performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, also known as "Superfund") as amended by the Superfund Amendments and Reauthorization Act (SARA) and the CERCLA regulations published in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). TN&A is performing this work under contracts issued by USACE, Omaha District for the EPA, Region IX.

The remedial action being implemented according to the record of decision (ROD; Record of Decision for the Pemaco Superfund Site [EPA, 2005]) consists of dual-phase extraction (DPE), groundwater extraction, and soil vapor extraction processes. These processes remove volatile organic compounds (VOCs), namely trichloroethene (TCE), from the subsurface (Figure 1.2). A comprehensive description of the extraction and treatment system is provided in the *Final Remedial Design Report, Pemaco Superfund Site, (*TN&A, 2006). Electrical resistance heating (ERH) is also being used in the source area (the area with the highest TCE concentrations) to expedite the remediation process, which is anticipated to take 5 years (Figure 1.3). The AOR 2007 focuses on the treatment system performance as the details regarding ERH will be the subject of a separate report. This report covers two phases of the planned remedial action, as described in the Final Design Report (TN&A, 2006):

- Phase I: commissioning and startup of the groundwater (April 25, 2007) and vapor (May 4, 2007) extraction and treatment systems,
- Phase II: operation and maintenance (O&M) of the vapor and groundwater extraction and treatment system during thermal treatment of the source area via ERH, which began on September 25, 2007, is currently underway.

Progress on the groundwater and soil vapor remediation is documented by the Quarterly Groundwater Monitoring Reports, on-going reports, and real-time website data for the ERH remediation. A final report documenting the remediation of the ERH area will be submitted to the EPA 90 days after the cessation of heating.

This AOR describes important elements of the treatment system operation, the optimization activities that were performed at the Site in 2007, and the performance of both the vapor and groundwater treatment systems.

1.1 SITE BACKGROUND

The Pemaco Superfund Site is comprised of 1.4 acres located in a mixed industrial and residential neighborhood in Maywood, Los Angeles County, California. Figure 1.1 shows the Site location and vicinity map. The facility formally operated as a custom chemical blender from the 1950s until 1991. A wide variety of chemicals were used and stored on site including chlorinated and aromatic solvents, flammable liquids, oils and specialty chemicals. These chemicals were stored in drums, aboveground storage tanks (ASTs) and underground storage tanks (USTs). In 1991, the facility was abandoned by its owner. Remaining stored chemicals in drums and storage tanks (USTs) were removed by the EPA between 1992 and 1998.

1.2 Investigative Site History

Environmental assessments performed between 1990 and 1999 identified soil and groundwater contamination that originated from the blending and storage of chemicals at the Site. A soil vapor extraction (SVE) system was installed as an interim treatment measure in 1998 and operated until 1999, when it was shut down due to community concerns about emissions from the thermal oxidation unit used to treat the extracted vapors.

The EPA enlisted the Pemaco Site into the Superfund program in 1999, and TN&A performed a full-scale remedial investigation between January 2001 and November 2001. TN&A conducted treatability tests including aquifer testing in December 2001 and a high vacuum dual-phase extraction (HVDPE) pilot test in December 2002. Additional source area evaluation was performed in September 2003 via membrane interface probes. The ROD for the soil vapor and groundwater systems was finalized in January 2005. Groundwater monitoring, “data gap” investigations, and pilot-scale activities for the evaluation of remedial technologies have been in progress for the Pemaco Site since May 2001.

1.3 Remedial Action Objectives

The remedial action objectives (RAOs) for the Pemaco Superfund Site are to protect human health and the environment from threats caused by exposure to contaminated soil, soil vapor, indoor air, and groundwater; and to restore groundwater to potential beneficial use as a drinking water source. All chemicals of concern (COCs) have been identified at the Site and are listed with their respective Site Specific Remediation Levels (SSRLs) in the in the Pemaco ROD dated January 13, 2005 (EPA, 2005). In order to meet the RAO for the primary contaminant at Pemaco, TCE, it will be necessary to remediate groundwater to 5 micrograms per liter (µg/L) and soil to 60 parts per billion by volume (ppbv) by the end of the remediation period, which is scheduled for 5 years.

For expedited source reduction to meet the groundwater and soil RAOs within the source area (approximately 30,000 cubic yards), subsurface heating by ERH began on September 25, 2007 to heat the soil and groundwater to the boiling temperature of water. Heating to temperature and holding at temperature for 30 days will require approximately 3.4 million kilowatt hours (kWh) of electricity and approximately 206 days. To meet the RAOs in the soil and groundwater using ERH, an additional 90 days of heating and an additional 3.0 million kWh of electricity would be required.

The City of Maywood, in conjunction with the Trust for Public Land, has developed the northern portion of the Site and adjacent properties as the Maywood Riverfront Park, a public recreational area. The future remedial activities at the Site will be integrated with the existence of this park.

1.4 Project team Roles and Responsibilities

Detailed explanations of the roles and responsibilities for each of the TN&A project team members directly connected to the operation of the treatment system are provided below.

Position	Name	Major Roles and Responsibilities
Project Director	Tim Garvey	• Ensure sufficient corporate resources for successful operation and completion of the project • Act as a technical resource and manage the bioremediation pilot test
Project Manager	Dacre Bush	• Manage all project activities and administrate funds • Assign and coordinate project resources • Maintain compliance with environmental, health and safety, and quality assurance • Report to the EPA Remedial Project Manager (RPM) on project progress, expenditures, and spending projections • Review and report cost and schedule variances
Senior Engineer	John Wingate	• Oversee the extraction and treatment system • Perform site inspections, review all physical and chemical data of the process equipment • Ensure proper staffing for system operation • Directly supervise two (2) full-time operators and the Site Operations Manager
Project Chemist	Ewelina Mutkowska	• Ensure quality assurance/quality control (QA/QC) of analytical data • Manage hard copy and electronic data • Provide oversight and guidance for the subcontract laboratories through various QA/QC activities, including data review/validation and systems and performance auditing
Site Operations Manager	Mark Prostko	• Ensure that the extraction and treatment system is staffed with qualified personnel, and that the staff has proper support for health and safety, equipment, and resolution of problems • Ensure proper operational parameters for the system as determined by the Senior Engineer and the technical oversight team • Record daily activities of the team members, track project progress, coordinate the sampling of all effluent streams with TN&A, and communicate with the Senior Engineer and the technical oversight team
Site Sampling Manager	David Allen	• Record daily activities, coordinate all required sampling, and communicate activities to the Project Manager • Perform inspections of the process equipment and piping/equipment in the well field • Grant access for site visitors, conduct daily health and safety “tailgate” meetings with the site workers, and perform the health and safety overview with site visitors

To perform O&M and to sample the groundwater and vapor treatment system, four (4) full-time employees are stationed at the Site. An organizational chart of the project team is provided as Figure 1.4. Additional resources from TN&A’s office in Ventura, CA are also utilized on an as-needed basis.

2.0 REMEDIAL ACTION

The remediation system for the Site is a semi-automated, vapor and groundwater extraction and treatment system that is designed to reduce the mass of VOCs present in soil and groundwater at the Site. Groundwater is extracted from the subsurface using down well pneumatic submersible pumps in the deep wells and "stingers" in the shallower perched zone wells. Thirty-three (33) total fluid pumps in the exposition aquifer and 23 DPE wells in the perched aquifer extract groundwater. SVE is conducted concurrently from 58 electrodes, 29 vapor recovery (VR) wells, and selected perched zone wells to remove contaminated soil vapor in the ERH area and perched groundwater zone (Figure 1.2 and Figure 1.3).

The remediation system separates the condensate from the extracted vapors and treats the removed condensate and groundwater using liquid-phase granular activated carbon (GAC) adsorption. The carbon adsorption vessels are operated in series prior to discharge of the groundwater to the sanitary sewer. The contaminated soil vapors are treated by a flameless thermal oxidizer (FTO) followed by vapor-phase GAC adsorption units. The vapors exiting the FTO are "conditioned' by removing excess heat and moisture content before entering the two (2) vapor phase GAC vessels, that are operated in series. Vapor extraction is conducted concurrently with groundwater extraction, but the vapor treatment system runs independently of the groundwater treatment system (Figures 2.1 and 2.2).

The remediation system is located within a steel frame building that sits atop a 4-inch high concrete containment berm and foundation (Figure 2.3).

The primary remedies that have been implemented at the Site include DPE, and thermally-enhanced DPE in the source area using ERH in which the subsurface is heated to the boiling temperature of water. Progress on the groundwater and soil vapor remediation is documented by the Quarterly Groundwater Monitoring Reports, on-going reports, and real-time website data for the ERH remediation. The operational phases of the remedial action are described in the following sections.

2.1 PHASE I – SYSTEM COMMISSIONING AND ESTABLISHMENT OF HYDRAULIC AND PNEUMATIC CONTROL

The first phase of active treatment involved the extraction of groundwater and vapors from the subsurface. All extraction, pipelines, valves, and controls were run through their operational routines. The treatment plant influent and effluent streams were measured and the desired removal efficiencies were confirmed. The treatment plant equipment was tested at full capacity to confirm full mechanical and electrical function as well as control sensitivity. The intent of Phase I was to test the equipment at full capacity of the vapor and liquid streams in the field; to identify health and safety issues; and to fix problems with controls, equipment, personnel, data gathering, communication, etc. This phase was also used to establish hydraulic and pneumatic control prior to commencement of ERH. Groundwater extraction and treatment began on April 25, 2007 and vapor extraction and treatment began on May 4, 2007.

2.2 PHASE II – ERH AND CONTINUED VAPOR AND GROUNDWATER EXTRACTION

Phase II of the remediation was signified by the application of full power to the electrodes on September 25, 2007. Phase II is a continuation of the vapor and groundwater extraction, with operational modifications to accommodate the ERH (source area remediation) program. The thermal aspect of Phase II entails the energizing of 58 electrodes. Thermal Remediation

Services, Inc. (TRS) is responsible for the operation, maintenance and performance of the ERH system.

The method for heating the soil at the site is ERH and is accomplished the installation of electrodes into the subsurface in the most contaminated part of the Site (approximately 14,000 square feet). Electrical current flows from one electrode to another and the soil, acting as a “resistor,” heats up. The reasons for heating the soil are 1) to greatly increase the rate of contaminant removal, and 2) to increase soil permeability in order to facilitate contaminant recovery from fine-grained soils. Because of the effectiveness of the heating, the ERH phase of remediation will be significantly shorter than the DPE phase, although some DPE will be operated during the thermal phase. Both DPE and ERH technologies will use the same extraction and treatment equipment.

Attainment of the first temperature goals in the temperature monitoring probes (TMPs) was forecast to occur after 73 days of ERH operation, however, at the time of the submission of the draft AOR, 120 days have passed since full power was applied to the electrodes. Ten percent of the thermocouple readings are validated by TN&A using hand-held instrumentation. Once all the temperature goals have been met simultaneously, the 30-day holding period will begin. If temperature goals are not met, heating will continue until the temperature goals are met. If the temperature goal is met prior to the estimated 73 days, the 30-day holding period will start as soon as the temperature data are validated. At the time of the submission of the draft AOR 2007, the ERH system had reached a temperature of 87.5 degrees Celsius (^{o}C) in 81% of the TMPs.

During the holding period, temperatures cannot drop below the attainment goals. Data gathering and analysis during this phase will help to determine if the ERH portion of the remediation will move forward. The decision-making process of additional ERH is described below.

2.3 PHASE III – POST-ERH VAPOR AND GROUNDWATER EXTRACTION

Phase III will begin after cessation of the active thermal heating. The primary technology for Phase III is DPE, groundwater pump and treat, and SVE from groundwater wells that have gone dry. Many of the exposition A zone wells have dried up and present an excellent opportunity for residual contaminant recovery through SVE, as is currently being performed at wells DA-4, DA-5, DA-10, DA-11, and RW-01-70 (Figure 1.2). The operations, sampling and data collection, and management of the extraction and treatment system will change significantly because the ERH system and the FTO will not be in operation. In addition, a better understanding of the subsurface conditions from the system operation and data collection from Phases I and II will aid in the optimization of Phase III. Data specific to the operation of the ERH system will not be included in the Sampling and Analysis Plan (SAP) during Phase III.

Because the duration of this phase is estimated to be 5 years, the frequency of the data collection, and in some cases the types of data required, will be evaluated. Operation of the extraction system and treatment will be modified to allow for reduced man-hours, and a significant change in the project personnel. These reductions will be possible because the ERH and FTO systems will not be operated, and the expected concentrations in the vapor and liquid streams should be substantially lower than during Phase I and Phase II.

The operation of Phase III may also include biological augmentation, which will be reflected in a modified O&M plan and SAP to include the biological parameters.

3.0 VAPOR EXTRACTION AND TREATMENT

The soil vapor treatment system was installed to reduce VOC contamination, namely TCE contamination, within the source area. Soil vapors, extracted from 25 DPE perched wells, 33 exposition wells, and 28 VR wells (Table 2.2 and Figure 1.2), are conveyed to the treatment plant. The vapor treatment system consists of an FTO and two (2) GAC vessels filled with 3,000 pounds of GAC installed in series for polishing purposes. The soil vapor extraction system began operation on May 4, 2007.

The flow rate of the vapors from all vapor extraction (VE) and DPE wells into the FTO is measured by flow element (FE) FE-101. The average flow rate in 2007 was 553 standard cubic feet per minute (scfm). A total of 176,696,475 standard cubic feet (scf) were treated by the vapor treatment system in 2007.

The VOC emission rates in 2007 were significantly lower than the discharge limit of 55 pounds per day allowed by the South Coast Air Quality Management District (SCAQMD). The analytical results showing compliance with the vapor discharge guidance documents are discussed in Section 3.3 below. See Section 9.1 for more information on the vapor discharge compliance.

Field data and vapor samples for laboratory analysis were collected on daily and weekly frequencies during 2007 to ensure efficient operation of the vapor treatment system. These data will be discussed in the following subsections.

3.1 WELL FIELD OPERATION AND MONITORING

Physical parameters were measured in the field at selected meters and gauges using prepared field sampling forms 7 and 12 (see Table 3.1 and Appendix 1). Well valve operations are recorded on a weekly basis to determine the efficiency of the vapor extraction from each of the wells. The average vacuum, average photoionization detector (PID) concentration, and average temperature for each of the vapor extraction wells during 2007 are summarized in Table 3.2. Perched wells PA-03 and PA-05 had the highest average PID concentrations in 2007 of 480.4 parts per million (ppm) and 976.5 ppm, respectively.

3.1.1 Perched Zone DPE Well Operation

DPE streams from the perched zone enter the treatment plant through the following four (4) headers: DPE-A, DPE-B, DPE-C, and DPE-D (Table 3.3). At the initiation of the DPE in May 2007, the perched zone water levels were at their highest levels on record and many well screens were submerged, rendering the down well stingers ineffective. The O&M crew overcame this problem by: 1) initially shortening all of the stingers and 2) venting the wells to allow air in and to enable water to be sucked out. Gradually, over a period of months, the stingers were lengthened to their design depths, which is 6 inches from the bottom of the DPE well. As is implied in Table 3.3, average flow from the individual DPE wells exceeded the 10 scfm per well design goal (this average has not been confirmed on a well-by-well basis because the wells continue to produce water at a rate that exceeded the original predictions, i.e., that the perched zone would dry up).

Based on the PID measurements at the DPE headers, the most contaminant mass is being removed by DPE-A, followed by DPE-B, DPE-D and then lastly by DPE-C. As a result of the lowest PID concentrations, DPE-C was frequently turned off so that higher vacuum could be directed to the ERH area, fed by VE-3, to allow for higher flow.

Another O&M challenge common to many DPE networks is the accumulation of scale. Debilitating scale forms mainly in wells PB-1, PB-2, PD-4, PD-5, and PD-6. As a result, the O&M crew must clean the stingers and connecting pipelines using a high-pressure washer with a pipe cleaning spray head and a narrow gauge hose. The condensate sumps and pumps for headers DPE-B and DPE-D must be similarly cleaned to remove scale accumulation.

3.1.2 Exposition Zone and ERH Area Vapor Extraction Well Operation

Vapor extraction from the exposition zone and the ERH area enters the treatment plant through headers VE-1, VE-2, VE-3, and VE-4. During the initial three (3) months of vapor extraction, various vapor extraction scenarios were attempted with the exposition zone wells. In general, when the vacuum to the exposition zone wells was increased, the plant would receive an increased amount of fine-grained sediments that resulted in clogged filters and caused an inordinately high number of unplanned shutdowns. The operators experimented with varying mixes of vacuums and pumping rates; the resulting cost was high (in terms of unplanned shutdowns and increased labor) versus the benefit of slightly higher pumping rates. Since most of the exposition wells are located outside the source area, the estimated increase in the contaminant mass removed as a result of these exercises was minimal.

As a result of continued pumping, several A-zone wells have become mostly dry including DA-1, DA-2, DA-4, DA-5, DA-6, DA-9, DA-10, DA-11, and DA-12. These mostly-dry wells can now be used for vapor extraction without impacting the plant O&M. At the time of the submission of the draft AOR, wells DA-4, DA-5, DA-10, DA-11, and RW-01-70 are being used to facilitate vapor recovery from within and around the ERH area.

In Table 3.3, the header measurements from VE-2 are representative of the ERH perimeter wells DA-4 and DA-5. Header VE-4 measurements are representative of the ERH area wells DA-10 and DA-11. The dry A-zone well RW-01-70 was plumbed into the ERH well extraction network, which joins all flow from the ERH area in header VE-3. The average flow rate from VE-3, located in the ERH area, appears to be lower than the average flow rate of the TRS condenser because VE-4 is occasionally used as a conduit for ERH area flow when the VE-3 condensate sump is full.

The vapor flow from the ERH area averaged 366 scfm (TRS condenser; Table 3.3). Despite increasing vacuum to the ERH area by shutting down other headers, flow did not increase significantly. Thus, the “current” extraction rate from the ERH area is considered to be maximized given the site geological conditions however, this condition may change as ERH progresses.

Field measurements were collected on a daily basis at the eight (8) influent headers to the vapor manifold (DPE-A, DPE-B, DPE-C, DPE-D, VE-1, VE-2, VE-3, VE-4), and the TRS condenser and were recorded on Form 1 that is provided in Appendix 1. Averages of the field readings for all the manifold data collected in 2007 are summarized in Table 3.3. Average flow rates from each of the manifolds were calculated using the differential pressures, vacuums, and temperatures recorded on Form 1 (Table 3.1).

3.2 TREATMENT PLANT OPERATION AND MONITORING

The purpose of the operational sampling, analysis, and measurement of physical parameters is to support optimization, maintenance, and operation of the vapor extraction and treatment system. Details on the field data collection are discussed in the Management and Operation and Maintenance Plan (MOMP; TN&A, 2007).

As part of the operation and monitoring of the vapor extraction and treatment system, influent and effluent vapor samples are collected at daily, weekly, and monthly frequencies for laboratory analyses in accordance with the SAP (TN&A, 2007). Additional samples are collected within the treatment compound to ensure efficiency of the remediation system. All vapor sampling ports are listed in Table 3.4 and locations of the meters and gauges are presented in Figures 2.1 and 2.2.

3.2.1 Sample Collection and Analysis Methods

In accordance with the SAP, the following samples are collected for laboratory analysis using sample collection techniques described in the SAP (TN&A, 2007):

Analytes	Method	Sample Container	Laboratory
TCE & 2-6 Highest VOCs by TO-15	TO-15	Batch certified 400-milliliter (mL) Summa® canister	EPA Region 9 Laboratory
VOCs by TO-15	TO-15	Batch certified 400-mL Summa® canister	EPA Region 9 Laboratory
VOCs by TO-15SIM	TO-15SIM	Individually certified 6-L Summa® canister	Air Toxics Ltd.
C1-C6 TO-3(M)	TO-3(M)	Tedlar® Bag	Calscience Environmental Laboratories, Inc.
Dioxins and Furans	CARB 428	Glass fiber filter, XAD 2 resin trap	Vista Analytical Laboratory

Notes: CARB – California Air Resources Board; mL – milliliter; SIM – selective ion mode

Further details on the vapor sampling program are provided in Table 3.4. All samples were shipped under appropriate chain of custody protocol to the laboratory with the exception of the samples analyzed by Calscience which are picked up on site by a courier.

All sample types were grab samples with the exception samples collected from SP-104a and SP-109a. Dioxin and furan samples collected from these ports were 4-hour composite samples and the TO-15SIM samples collected from these sample ports were 1-hour composite samples.

In addition to the regular samples collected as shown in Table 3.4, a source test was completed by Almega Environmental and Technical Services from June 20 to 21, 2007 to demonstrate compliance with the EPA and SCAQMD emissions standards. Samples were collected from SP-102 (Pre-FTO), SP-103a (Post-FTO), SP-104a (Post-vapor conditioner), and SP-109a (Post-GAC). Samples were analyzed as follows:

Parameter	Method	Station ID
VOCs	EPA TO-15	SP-102, SP-104a, and SP-109a
Dioxins and furans	CARB 428	SP-104a and SP-109a
Hydrochloric acid	CARB 421	SP-104a, and SP-109a
Total VOCs as total gaseous non-methane organics	SCAQMD 25.1 SCAQMD 25.3	SP-102 SP-104a and SP-109a
Nitrous oxides, oxygen and carbon dioxide	SCAQMD 100.1	SP-104a and SP-109a
Carbon monoxide	SCAQMD 10.1	SP-104a and SP-109a
Stack Sampling and Stack Gas Parameters	SCAQMD 1-4 CARB 421/428 SCAQMD 4.1 CARB 421/428	SP-102 SP-104a SP-103a SP-109a

The source test results are presented in Appendix 4.

3.2.2 Process Vapor Analytical Results

Vapor samples are collected from the influent streams to the manifold (SP-110 through SP-117) on a weekly basis. These vapor samples are submitted for laboratory analysis of VOCs by method TO-15. Analytes that were commonly detected in the manifold samples during 2007 are shown in Table 3.5. The most commonly detected analytes include TCE, toluene, n-hexane, cyclohexane, propylene, and *cis*-1,2-dichloroethene (*cis*-1,2-DCE). All positively detected analytes are shown in Table A2.1 of Appendix 2.

Vapor samples from SP-801 through SP-805 have been collected since the ERH began in September 2007 and analyzed for VOCs by TO-15 on a weekly basis. Concentrations of TCE ranged from 1.7 ppbv (for SP-804 on 11/20/07 and for SP-805 on 9/27/07) to 19,000 ppbv for SP-805 on November 20, 2007. Analytes that were commonly detected in the ERH zone samples during 2007 are shown in Table 3.5. All positively detected analytes are shown in Table A2.1 of Appendix 2.

Vapor samples are collected from the combined vapor streams at SP-102 to determine the influent concentration to the FTO on a daily basis. All positively detected VOCs in the samples collected from SP-102 for TO-15 analysis are shown in Table 3.6. The most commonly detected VOCs include TCE, toluene, n-hexane, cyclohexane, propylene, and *cis*-1,2-DCE. The concentration of TCE as a function of time is shown in Graph 3.1 as well as the daily mass of TCE and VOCs removed. The concentration of TCE has shown a decreasing trend since the system startup in May 2007; however, the influent TCE concentration is expected to increase as the subsurface temperature increases from ERH. A similar trend is observed in the daily mass of VOCs removed.

In addition to the analytes detected by TO-15 that are listed in Tables 3.5 and 3.6, tentatively identified compounds (TICs) such as dimethylbutanes, methylpentane, and methylcyclohexane are listed in Table 3.7. Although significant concentrations of these compounds are detected, the results are still reported as estimated concentrations. For all TIC detections in vapor samples, see Table A2.2 in Appendix 2.

Vapor samples are also collected from SP-102 on a weekly basis for light hydrocarbon analysis by TO-3(M). The analytical results for samples collected from SP-102 for analysis by TO-3(M) are shown in Table 3.8 along with the PID measurements that were collected in the field. Significant concentrations of methane (from 120 parts per million by volume [ppmv] on 10/1/07 to 5,200 ppmv on 6/20/07) and n-hexane (from 130 ppmv on 7/31/07 to 730 ppmv on 9/11/07 and 10/23/07) were detected in 2007.

To determine the FTO efficiency, a vapor sample is collected from SP-104 on a weekly basis. Vapor samples are also collected from SP-106 and SP-108 on a weekly basis to determine GAC efficiency and to facilitate O&M by predicting carbon breakthrough. Prior to discharge to the atmosphere, a vapor sample is collected from SP-109. All data obtained from these sample ports are used as screening-type data. Analytical data for the VOCs that were positively detected in the samples collected from the treatment plant are summarized in Table 3.9. In addition, TICs that were detected in samples collected from SP-109 are listed in Table 3.7.

Samples collected from SP-104 and SP-109 were analyzed by TO-15 and by TO-15SIM. The comparison of these results is shown in Table 3.10. The reporting limits for TO-15SIM are much lower than those for TO-15, and thus, they are considered to be more accurate. In addition, the Summa® canisters used to collect the samples for analysis by TO-15SIM are individually certified and not batch certified such as those used for TO-15 analysis.

Samples were also collected from SP-104a and SP-109a twice per month for August and September and monthly thereafter through December 2007 for analysis of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) by CARB 428. The detected plant dioxin and furan emissions were used in a risk assessment model to show compliance with SCAQMD Rule 1401. This rule specifies limits for maximum individual cancer risk and non-cancer acute and chronic hazard index from new emission sources such as the FTO. The model showed that the risk associated with potential exposure to toxic air contaminants (TACs) at the treatment plant fence line, the nearest residence, and at the closest portion of the park are less than one-in-a-million. The model shows both acute and chronic hazardous indexes from potential exposure to non-cancer TACs at the three distances are less than 1 (Appendix 4).

The dioxin and furan National Emission Standard for Hazardous Air Pollutants (NESHAP) 2.00E-04 µg toxic equivalent (TEQ)/ dry standard cubic meter (dscm) is used solely for the purpose of comparison (Table 3.11). This limit is not a regulatory standard for the Pemaco treatment plant. Total concentrations of dioxins and furans for SP-104a ranged from 4.38E-07 µg/dscm (12/12/07) to 2.04E-05 µg/dscm (8/16/07); total concentrations of dioxins and furans for SP-109a ranged from 4.68E-07 µg/dscm (8/16/07) to 1.83E-05 µg/dscm (6/20/07). All results were at least one (1) order of magnitude below the NESHAP limit of 2.00E-04 µg/dscm in 2007. The results for the dioxin and furan analyses are presented in Table 3.11.

All laboratory reports are provided in Appendix 4. A copy of the risk assessment model and results are included in Appendices 4 and 5.

3.2.3 Quality Assurance / Quality Control Summary

Process vapor data are considered to be screening-type data and therefore field QC samples were not collected (see the SAP for further details [TN&A, 2007]). However, during operation of the system numerous volatile organic compounds were detected, and a trip blank sample labeled SP-900, was included with the weekly vapor samples that were shipped to the EPA Region 9 Laboratory for analysis by TO-15. Trip blanks are used to evaluate if the samples were contaminated by VOCs during shipment, handling, or storage on-site and in the laboratory. The positive detections of VOCs in these trip blank samples are summarized in Table 3.12.

Due to the presence of VOCs, including common laboratory contaminants such as methylene chloride, acetone, 2-butanone, and cyclohexane, the concentrations of the specific trip blank VOC contaminants are used to determine if the analytical results of the samples associated with the particular batch require qualification.

Laboratory method blanks with positive VOC detections are currently being investigated. Due to the low concentration of VOCs in the method blank samples, the sample results are unlikely to be affected.

Laboratory QA/QC procedures were carried out according to EPA method specifications and the data was accepted based on the QA/QC criteria established by the EPA. All samples were shipped under appropriate chain of custody protocol at the method-specified temperature limit. All analyses were conducted within the specified holding time limit for each method.

3.2.4 Performance Evaluation Sampling

Performance evaluation samples were spiked by the EPA Region 9 QA/QC office using an XAD resin trap provided by Vista Analytical Laboratory. Two (2) air samples were collected on November 14, 2007; one was submitted to Vista Analytical Laboratory for analysis and the other was submitted to Frontier Analytical Laboratory for analysis by CARB 428 under appropriate chain of custody protocol. Validated analytical results for are summarized in Table A3.1 of Appendix 3; lab reports and data validation reports are provided in Appendix 4. The relative percent difference between PE samples ranged from 0% to 38.7%. Further evaluation of the PE samples was conducted by the EPA Region 9 QA/QC office. Preliminary results show that PE results for PCDDs and PCDFs were scored and all were within acceptance limits. The official report summarizing these results will be submitted to the EPA in the near future.

3.3 SYSTEM PERFORMANCE

Since the system start-up on May 4, 2007, a total of 176,696,475 scf soil vapor has been treated by the vapor treatment system. The total volume of vapor extracted from the subsurface is determined using the differential pressure from dPIT-101, the temperature from TIT-102, and the pressure from PT-101. The average flow rate of vapor extracted from the well field was 553 scfm.

In 2007, the average uptime was 74% (4,314 hours of operation); however, due to numerous improvements to the treatment system discussed in Section 6.0 and as shown in Table 6.1, the monthly uptime has increased significantly in September to 100% and has remained above 81% for the remainder of the year (Table 3.13).

From May through December 2007, approximately 12,736 pounds of vapor-phase VOCs were removed, and approximately 197 pounds of TCE have been removed from the subsurface at the Pemaco Superfund Site (Table 3.13). The average removal rates of VOCs and TCE in 2007 were approximately 56 pounds per day and 0.88 pounds per day, respectively.

The concentration of TCE, as well as the mass of TCE and VOCs that are removed as a function of time are shown in Graph 3.1.The cumulative mass of total VOCs removed since the system startup as well as the total volume of vapor treated are shown in Graph 3.2. The curve indicates that VOCs continue to be removed by the system, but at a declining rate, possibly due to mass transfer limitations as the subsurface contamination is removed and treated.

To demonstrate that the emission of the treated vapor to the ambient surroundings is in compliance with the SCAQMD guidance (Appendix 5), analytical results from the effluent stream are summarized in Table 3.14. For further discussion of the guidance documents, see Section 9.1. The VOC emission rates in 2007 were significantly lower (ranging from 3.10E-05 pounds per day on September 19, 2007 to 3.50E-03 pounds per day on September 5, 2007) than the discharge limit of 55 pounds per day allowed by the SCAQMD. The maximum emission limits for specific VOCs are listed in Table 3.14. These limits are based on the results of the Tier 2 Screening Risk Assessment (Appendix 5). None of the individual limits were exceeded in 2007.

As described in Section 3.2, the dioxin and furan concentrations in 2007 ranged from one (1) to three (3) orders of magnitude below the NESHAP limit of 2.00E-04 µg/dscm.

The destruction and removal efficiency (DRE) of the vapor treatment system is summarized in Table 3.15. Since samples collected from SP-104a and SP-109a are only analyzed for VOCs by TO-15SIM, DREs for light hydrocarbons, and TICs could not be calculated. As a result of the method limitation, the total VOC DREs are biased high. The DRE of total VOCs ranged from 99.9922 % on September 5, 2007 to 99.9999% on September 18, 2007 and October 4, 2007. Since the detection limits are lower for TO-15SIM than for TO-15, and the influent samples were analyzed by TO-15 and the post-FTO and post-GAC samples were analyzed by TO-15SIM, some analytes were positively detected in the post-FTO and post-GAC samples that were not detected in the influent sample. As a result of the analysis method discrepancy, some individual DREs could not be calculated. The lowest individual DRE was 87.8788 % for acetone on September 5, 2007, which is a common lab contaminant. All other individual DREs were greater than 98.9286 %.

Vapor-phase GAC has not needed replacement in 2007 due to the very low loading it receives since the vapors have already passed through the FTO prior to entering the GAC vessels. Details on the GAC requirements and disposal are discussed in Sections 8.0 and 10.0.

4.0 GROUNDWATER EXTRACTION AND TREATMENT

The groundwater treatment system was designed to provide hydraulic containment of the dissolved groundwater plumes and to capture and treat contaminant mass. The groundwater extraction wells that were in operation during 2007 are listed in Table 4.1. The locations of the 24 DPE wells are illustrated in Figure 1.2.

The extracted groundwater is conveyed to the treatment compound where it passes through two (2), 3,000 pound liquid-phase GAC vessels in series to remove VOCs from the groundwater. A carbon life evaluation was performed on April 25, 2007 to determine the service life of the carbon to ensure adequate change-outs (see Sections 8.0 and 10.0 for more details on carbon change-outs and Appendix 4 for Calscience's laboratory report). The groundwater is finally discharged into the sanitary sewer (see Section 9.2 for more details on the sewer discharge permit). During 2007, a total of 11,460,978 gallons of groundwater were extracted at an average flow rate of 31 gallons per minute (gpm).

The VOC discharge rate in 2007 was significantly lower than the discharge limit of 1,000 µg/L allowed by the SDLAC.

Field data and groundwater samples for laboratory analysis were collected on daily and weekly schedules during 2007 to ensure the effective performance of the groundwater treatment system. These data will be discussed in the following subsections.

4.1 WELL FIELD OPERATION AND MONITORING

A list of the 33 exposition wells equipped with dedicated QED Environmental pumps is provided in Table 4.1. Groundwater will be continuously extracted for the duration of the remediation process, which is anticipated to take 5 years. However, since the start of the groundwater extraction activities, several wells in the exposition A zone have become dry; namely DA-1, DA-2, DA-4, DA-5, DA-6, DA-8, DA-9, DA-10, DA-11, and DA-12. Exposition B zone wells DB-7 and DB-8 are also mostly dry.

The pumping rates for each of the groundwater extraction wells are calculated using pulse counters located at each of the wells. For each click, an assumed volume of 0.65 gallons of water is pumped. Data from the pulse counters are collected on a weekly basis using Form 13 (see Table 3.1). The minimum, maximum, and average pumping rates for each well and corresponding manifold are shown in Table 4.1. The average air regulator pressures at each extraction well are also listed in Table 4.1. The average flow rates ranged from 1 gallon per day in DA-8 and DA-9 to 7,572 gallons per day in MW-24-110.

4.2 TREATMENT PLANT OPERATION AND MONITORING

The purpose of the operational sampling, analysis, and measurements of physical parameters is to support optimization, maintenance, and operation of groundwater extraction and treatment system. Details on the field data collection are discussed in MOMP (TN&A, 2007).

As part of the operation and monitoring of the groundwater extraction and treatment system, influent and effluent water samples are collected on a weekly basis for laboratory analyses in accordance with the SAP (TN&A, 2007). Additional samples are collected within the treatment compound to ensure efficiency of the remediation system. The groundwater sampling ports are listed in Table 4.2 and the locations of the meters and gauges are presented in Figure 2.1 and Figure 2.2.

4.2.1 Sample Collection and Analysis Methods

In accordance with the SAP, the following samples are collected for laboratory analysis using the sample collection techniques described in the SAP:

Analytes	Method	Sample Container	Laboratory
VOCs + 1,4-dioxane, hexane	EPA 8260B	Three (3) 40-mL VOAs	Calscience
1,4-dioxane	EPA 8270C	1-liter amber bottle with sodium thiosulfate or unpreserved	Calscience

Notes: VOAs – volatile organic analysis vials

Glass VOAs with Teflon®–lined septums are used for sampling groundwater for VOCs. The sample vials are filled completely so the water forms a convex meniscus at the top and then Teflon™–lined cap is screwed on tightly to ensure no air space (i.e., bubbles) is present in the vial and to prevent the container from leaking.

Effluent samples from the treatment system are collected every three (3) months to evaluate compliance with the Self-Monitoring Requirements Permit No. 16961 issued by the SDLAC. In accordance with the permit, grab effluent water samples are collected at sampling port SP-209 (Figure 2.1). For unstable parameters such as chemical oxygen demand (COD), TSS, and lead, 24-hour composite samples are collected using an automatic sampler that collects uniform aliquots of groundwater over the programmed time to attain the desired analysis volume. Analytical requirements for water samples collected at SP-209 are summarized in Table 4.6.

The effluent groundwater stream is sampled for the following parameters:

- SOM01.1 or SW 8260B for VOCs,
- SOM01.1 or SW 8270C for semivolatile organic compounds (SVOCs),
- EPA 160.2 for Total Suspended Solids (TSS),
- EPA 410.4 for Chemical Oxygen Demand (COD),
- SW 6010B for lead,
- EPA 376.2 for dissolved sulfide, and
- EPA 5520B for oil and grease.

All groundwater samples are picked up on site by a courier from Calscience Environmental Laboratories, Inc.

4.2.2 Process Water Analytical Results

Groundwater samples are collected from the influent streams, GW-1, GW-2, and GW-3, to the manifold (SP-213 through SP-215) on a weekly basis. These samples are submitted for laboratory analysis of VOCs by EPA 8260B. Analytes that were positively detected in the manifold samples during 2007 are shown in Table 4.3.

The extracted groundwater was treated for VOCs using GAC as described in Section 4.0. Samples were collected and analyzed for VOCs by EPA 8260B and for 1,4-dioxane by EPA 8270C, from the following locations on a weekly basis: SP-201, SP-210, SP-212, SP-204, SP-

206, SP-208, SP-210, and SP-212 (Table 4.6). General diagrams of the GAC vessels, including the sample port locations, are provided in Figures 2.1 and 2.2.

All positively detected VOCs in the samples collected from sampling ports located in the plant EPA 8260B analysis are shown in Table 4.4. The most commonly detected VOCs include TCE, toluene, chloroform, and *cis*-1,2-DCE. The concentration of TCE as a function of time is shown in Graph 4.1 as well as the daily mass of TCE and VOCs removed. The concentration of TCE has shown a decreasing trend since the system start-up in April 2007; however, the influent TCE concentration is expected to increase as the subsurface temperature increases with ERH. A similar trend is observed in the daily mass of VOCs removed.

All laboratory reports are provided in Appendix 4.

4.2.3 Quality Assurance / Quality Control Summary

System performance data are considered to be screening-type data and therefore no field QC samples were collected.

Laboratory method blanks with positive VOC detections are currently being investigated. Due to the low concentration of VOCs in the method blank samples, the sample results are unlikely to be affected.

Laboratory QA/QC procedures were carried out according to EPA method specifications and the data was accepted based on the QA/QC criteria established by the EPA. All samples were shipped under appropriate chain of custody protocol at the method-specified temperature limit. All analyses were conducted within the specified holding time limit for each method.

4.2.4 Performance Evaluation Sampling

Performance evaluation samples were also collected using low and high spiked vials prepared by the EPA Region 9 QA/QC office. These samples were submitted to Calscience Environmental Laboratories, Inc. under appropriate chain of custody protocol on November 30, 2007 for analysis of 1,4-dioxane by SW 8270C. Evaluation of the PE samples was conducted by the EPA Region 9 QA/QC Office. Preliminary results show that PE results for 1,4-dioxane were scored and both were within acceptance limits (see Table A3.2 in Appendix 3 for the results). The official report summarizing these results will be submitted to the EPA in the near future.

4.3 System Performance

Since the system start-up on April 25, 2007, a total of 11,460,978 gallons of contaminated groundwater has been treated by the groundwater treatment system. The average flow rate was 31 gpm in 2007.

In 2007, the average uptime was 94% (5,667 hours of operation) as shown in Table 4.5. The groundwater treatment system was offline due to GAC vessel repair in June 2007 and due to air compressor maintenance in September 2007.

From April through December 2007, approximately 47.1 pounds of VOCs including TCE have been removed and approximately 26.2 pounds of TCE have been removed from the subsurface at the Pemaco Superfund Site (Table 4.5). The average removal rate of VOCs and of TCE in 2007 were approximately 0.14 pounds per day and 0.08 pounds per day, respectively.

The concentration of TCE as well as the mass of TCE and VOCs that are removed as a function of time, are shown in Graph 4.1. The cumulative mass of total VOCs removed since the system startup as well as the total volume of vapor treated are shown in Graph 4.2. The curve indicates that VOCs continue to be removed by the system, but at a declining rate, possibly due to mass transfer limitations as the subsurface contamination is removed and treated.

To demonstrate that the discharge of the treated groundwater to the public sanitary sewer is in compliance with the SDLAC's sewer discharge permit, analytical results from the effluent stream are summarized in Table 4.6. The concentration limits on individual VOCs are not exceeded, nor are any of the limits for the additional analytes (SVOCs and general chemistry parameters). The total VOC concentration is calculated using individual VOC concentrations that are greater than 10 µg/L. The only VOCs detected include bromodichloromethane, bromoform, chloroform, dibromochloromethane. The only SVOC that was detected was bis(2-ethylhexyl) phthalate on November 20, 2007. The VOC discharge rate in 2007 ranged from below the reporting limit of 1 µg/L on April 25, 2007 and on November 20, 2007 to 90 µg/L on August 23, 2007 which is significantly lower than the discharge limit of 1,000 µg/L allowed by the SDLAC. For further discussion of the sewer discharge permit, see Section 9.2.

The destruction and removal efficiency (DRE) of the groundwater treatment system is summarized in Table 4.7. The DRE of total VOCs ranged from 87 % on August 23, 2007 to 100% on April 25, 2007. Bromodichloromethane, bromoform, and dibromochloromethane were detected in the post-GAC sample on August 23, 2007 at concentrations that were higher than the influent concentrations and therefore the DREs for these compounds were not calculated. The lowest individual DRE was 51.6 % for chloroform on September 5, 2007. All other individual DREs for the VOCs were 100 %.

Since samples collected from SP-209 were not analyzed for 1,4-dioxane, the 1,4-dioxane concentrations that are reported in Table 4.7 were taken from sample port located after the secondary GAC vessel (SP-208 on 4/25/07 and 8/23/07; and SP-206 on 11/20/07). The DREs for 1,4-dioxane on April 25, 2007 and August 23, 2007 were 100.0% and 62.6%, respectively. A DRE could not be calculated for 1,4-dioxane on 11/20/07 since the concentration in SP-206 was greater than the total influent concentration.

Liquid-phase GAC was replaced twice in 2007 in each of the GAC vessels T-403 and T-404 as shown in Table 10.1. Details on the GAC requirements and disposal are discussed in Sections 8.0 and 10.0. Carbon efficiency, calculated as the pounds of contaminants removed divided by the pounds of carbon used times 100%, was calculated at less than 1% for 2007. The low carbon efficiency can be attributed to the premature change-outs necessitated by the clogging of fine soil particles and bio-growth.

5.0 TREATMENT SYSTEM CONTROLS

The Pemaco Superfund Site treatment system is designed for continuous semi-automatic operation, while minimizing the occurrence of alarm conditions. The treatment system is equipped with control devices to detect alarm conditions as they develop and to shut down the system until the alarms are acknowledged and cleared. The treatment system uses a system main computer (SMC) equipped with programming software for the programmable logic controller (PLC) and the SMC. The operation of the treatment system always ensures the safety of the operating personnel and the public as well as the protection of the equipment and the environment.

5.1 CONTROL SYSTEM

The remediation system is controlled and monitored by the SMC located in the treatment plant control room (Figure 2.3). The SMC provides an interface between the equipment and the operator which allows the operator to start, stop, reset, change set points, view alarms, and monitor the system. By using the mouse and the keyboard, the operator can navigate through various screens and perform system operations as shown in Figure 5.1.

The SMC communicates via an Ethernet network to the main control panel (MCP) PLC. The MCP PLC monitors and controls the physical inputs and outputs (e.g. level switches and turn on motors) of the system and holds all the information that controls the system. The logic path for the instrumentation and control system is illustrated in Figures 2.1 and 2.2.

The SMC is configured to data log all process analog signals at 1-minute intervals and also to monitor the trend of all the analog channels of the treatment system. The system control and data acquisition (SCADA) system has a built-in auto dialer that will phone or e-mail selected personnel when any alarm occurs.

The control system is fitted with an uninterruptible power supply (UPS) that will give the PLC and SMC approximately 1 hour of run time in the event of a power failure. This control allows the system to autodial the necessary personnel to inform them that the system went offline.

The system computer can be accessed over the internet using a “virtual network connection” or a Windows remote desktop connection. Connecting to the SMC using either of these methods will allow the user to have full access to the computer as if they were at the console.

5.2 PLC AND SMC SOFTWARE

The remediation system comes complete with a licensed copy of programming software for the system PLC and the SMC. All software is preloaded on the computer and the CD version is located in the control room. All programming software is a product of Rockwell Automation.

The PLC software allows for modifications to the existing program. The PLC software consists of the following two (2) components:

- RSLogix 5000 Mini, ENU, Revision 15.02.00
- RSLogix 5000 MLP, Revision 15.02.00

The SMC software allows for modifications to the existing display program, the data logging feature, and the autodialing feature. The SMC software consists of the following three (3) components:

- RSView32 Messenger Pro (autodialer), Revision: 2.12.00
- RSView32 Works 150, Revision: 7.20.00
- RSLinx Professional, Revision: 2.50.00

5.3 SYSTEM ALARM OVERVIEW

The system is designed to sound specific alarms to ensure the process and components are operating within the specified limits. There are several types of alarms that trigger specific system responses. A list of each of these alarms along with the associated system responses is presented in the CCR as Table 3.5.3 (TN&A, 2007). For activities that were performed to limit the number of alarms, see Section 6.0.

All alarms that occur must be acknowledged and reset before the alarm condition is cleared from the system. All alarms should be investigated to determine the reason for the occurrence. The alarm history is automatically logged to an alarm log file on a monthly basis. The computer is configured with a user name and password to prevent unauthorized access. Currently, TN&A employs three (3) full-time operators to ensure efficient and safe operation of the treatment system.

6.0 TREATMENT SYSTEM OPTIMIZATION & MAINTENANCE

After the initial 30-day shakedown conducted by Jacob & Hefner Associates (J&H) under the direction of Environmental Resources Management, Inc. (ERM), TN&A took over the operation of the treatment system and began troubleshooting the system. The shakedown period focused mostly on leaks, instruments, PLC controls, FTO start-up, and completing the as-built drawings. After the 30-day period, TN&A began to optimize system operation and to identify problems that impacted the operation of the FTO. Because the FTO is the critical component for vapor treatment at the Site, remedial action could not progress until the uptime for the vapor treatment system was improved (Table 3.13).

Issues with the treatment system addressed by TN&A as well as the optimization and problem remedies that were implemented are discussed below:

- Excessive sediment in the pumped groundwater caused numerous high-level shutdowns of the treatment plant due to the high pressure buildup in the bag filter system. Changing the filter to a larger size resulted in sediment buildup in the liquid-phase GAC. This problem was solved by switching to a dual-walled high efficiency filter bag and eliminating vacuum applied to the non-dry exposition wells.
- Algae buildup in the holding tanks and piping network led to the clogging of the bag filters, and thus, the shutdown of the treatment plant. A chemical maintenance plan was implemented, and an automated chlorine feed system was designed and installed to reduce the algae buildup.
- Excess heat in the FTO was caused by slug flow and/or vacuum in the header system. A modification to the DPE condensate sumps was implemented which involved the installation of four (4) pneumatic pumps with level controls. By keeping the level of water in the DPE condensate pumps low, a more even flow of air and improved uptime for the FTO were achieved.
- Sediment buildup in downhole pumps caused pump shutdown. Seven (7) pumps were pulled, valves were replaced, and the pumps were set several feet higher in the well.
- Tank T-101 collapsed during testing because it could not withstand full vacuum. TN&A specified that the tank needed to be operational at approximately 29 inches of mercury of vacuum. This tank was covered by warranty, and a replacement tank was ordered by ERM. The replacement tank showed signs of stress under operation, and was modified by welding a steel “belt” around the tank (among other welding) for reinforcement.
- While emptying the liquid GAC tanks T-403 and T-404, the fitting attaching the screen/filter to the tank side wall sheared-off under its own weight and the weight of the carbon at the point where it connects to the tank side wall. The shear point was caused by the cantilevered screen section with no under-support. The fittings were Schedule 40, not Schedule 80, as shown in the tank design drawing (see J&H’s Draft O&M Manual, 2007). The broken Schedule 40 fittings were repaired and replaced with Schedule 80 fittings.
- The Dekker Liquid Ring pumps, B-101 and B-102, continued oil blow-by to the FTO. This issue incurred FTO high temperature alarms and caused the vapor treatment system to shutdown. As a remedy, six (6) oil scavenge/return lines were installed from F-103/104 oil mist filters, and several locations downstream of the oil mist filters, to return oil to the

vacuum pumps. A leaking Dekker filter was replaced and additional filter inserts were installed in F-103/104 to remedy the oil issue.

- The potable water booster pump variable frequency drive and the P-402 variable frequency drive were reporting high voltage errors that are believed to have been caused by Southern California Edison, Inc. voltage spikes. The errors would occasionally shut down these pumps without notice, sometimes causing a plant shutdown. To attenuate the voltage spikes, line reactors were installed at both locations, thereby eliminating the high voltage errors.

- Groundwater tank high or low level alarms would shut off the air compressor, rendering the double diaphragm pumps for the vapor treatment system inoperable. A stand-alone compressed air line from the air compressor tank to the double-diaphragm pumps was installed to keep the double-diaphragm pumps operating after the groundwater treatment system shuts down (e.g. during GW tank High-High alarm).

- An unidentified T-402 High-High alarm occurred during operation causing the groundwater treatment system to shutdown. By raising the LSHH-402 High Level on T-402, the issue was remedied. This remedy also created additional tank holding capacity.

- Anguil Environmental Systems, Inc. was initially tasked, on two occasions, to inspect and to optimize the gas control valve settings, the burner temperature, the check influent vapor pressure alarms. They also adjusted the quench chamber spray nozzles, replaced the quench chamber insulation and repaired a weld. To facilitate FTO operation, TN&A installed a barometric damper, a vacuum gauge, and a pressure shut-off switch. A PLC interlock was added and various other PLC programming improvements to allow the FTO to operate in tandem with the vapor conditioning package.

- Numerous adjustments to all the level controls and alarm switches for all tanks, vessels and motors in the treatment plant were made. All programming was performed by Aspect Electrical Engineering & Service LLC's lead programmer, Mike Ebner, who worked with the TN&A engineers and operators.

- Oversized sheaves on the Dekker Liquid Ring Pumps B-101 and B-102 caused the two blower motors to run at a higher-than-specified ampacity. The high ampacity caused excess heat in the liquid ring vacuum pump electrical panel, necessitating the replacement of the motor overload protection models, some wiring, and the addition of a panel fan. Dekker did not catch the oversize sheave during QA/QC at the assembly shop. The oversized sheaves (10 7/8 inches) were replaced with new sheaves (9 3/4 inches).

- The FTO bellows insulation failed resulting in a hot spot and several days of FTO downtime. The insulation was worn away by a misdirected quench chamber spray nozzle. The insulation was repaired with a more rigid variation, which also failed after several weeks of operation. The second failure was patched in one day and that patch is currently performing well. Additional insulation upgrades are recommended during the next planned shutdown.

To improve the sustainability of the treatment system operation and to meet EPA's sustainability goals, solar panels were installed providing total of 2,949 kWh of energy in 2007 for an average of 16.2 kWh per day.

A summary of the treatment system optimization & maintenance activities including the changes that were made to the original design to address the aforementioned problems are described in Table 6.1. In addition to the major maintenance and optimization that was performed, daily and weekly maintenance activities performed at the Site are described in Table 6.2. The equipment maintenance schedule and the FTO maintenance schedule are provided as Tables 6.3 and 6.4, respectively.

7.0 DATA MANAGEMENT

All field and analytical data collected at the Site will be stored permanently in TN&A's Environmental Data Management System (EDMS), a comprehensive Sequel Server database (SQL) hosted on the company intranet behind a secure firewall. Stored data can be exported out of the EDMS in a variety of formats, including Microsoft Access databases, Microsoft Excel spreadsheets, delimited text files, dBASE files, and others. The format and structure of these files can be customized to meet the export requirements for nomenclature, data structure, and file size. Exported files can be transferred via e-mail, FTP protocol, written to CD or DVD, or other by using means depending upon the final size of the file(s). Integrity of the data stored in EDMS is maintained through software access permissions.

For the purposes related to the database, the collected data will be classified as either manually recorded or electronically recorded. Standard procedures for entering the data into the database have been developed for each classification of data. Data that were manually recorded by field personnel on forms listed in Table 3.1 were hand-entered into a pre-formatted electronic spreadsheet. The electronic spreadsheet is imported into the database using a standard query.

Electronically recorded data includes all data that are automatically recorded by sensors, that are recorded on laboratory equipment or that are output by another database and stored electronically. These data are then saved and transferred as an electronic file or an electronic data deliverable (EDD). Sources of EDDs can include, but are not limited to sub-contractors, (such as analytical laboratories) and data loggers.

The remedial system will be managed via a password-controlled website accessible to the entire project team. The full data management cycle in which data generated as either EDDs or as manually entered readings are imported the EDMS, and are then selectively mirrored to a web database from where the data can be dynamically accessed via specialized interfaces, as shown in Figure 7.1. Further information on the project website is discussed in Section 11.1.

8.0 RESOURCES AND UTILITIES

The resources (consumable materials including potable water, granular activated carbon, filter bags, salt, and caustic solution) and utilities (natural gas, electric power, and solar power) required for the O&M activities in 2007 are summarized in Table 8.1. Monthly usage records are based on the monthly bills or on field readings. Since the startup of the treatment system March 2007, the system has consumed 4,462 thousand gallons of potable water, 59,082 cubic feet of natural gas, 893,764 kWh of electric power, and 2,949 kWh of solar power.

Potable water is supplied to the treatment building from a water meter installed by Maywood Mutual Water Company. Potable water is provided as make-up water for the FTO scrubber, cooling water for the vapor conditioning package, and for other needs.

Natural gas is supplied to the treatment building from a gas meter installed by Southern California Gas Company. Natural gas is provided as supplemental fuel for the FTO. The gas meter is used to record the natural gas consumption of the FTO.

The power service, 480-volt, 800-amperes three phase, is provided by Southern California Edison, Inc. Electricity is obtained from the park transformer and metering cabinet located west of the treatment building.

The number of filter bags used and the carbon change-outs that occurred in 2007 are tracked and shown in Table 10.1. A total of 12,000 pounds of carbon was used in 2007 from the two (2) change-outs at T-403 and the two (2) change-outs at T-404.

As a result of the operation and maintenance of the treatment systems, consumable and disposable materials are generated as summarized in Table 8.1. All waste generated as a result of the treatment system operation is handled, transported and disposed of in accordance with TN&A's Waste Management Plan (2007). Waste management is discussed in Section 10.0 of this report.

9.0 PERMITTING, COMPLIANCE, AND ENVIRONMENTAL PROTECTION

The following documents have been prepared by TN&A to provide the framework for addressing potential environmental releases as a result of the operation of the treatment system:

- Environmental Protection Plan (EPP; TN&A, 2007)
- Waste Management Plan (WMP; TN&A, 2007)
- Emergency Response Actions (TN&A, 2007)

These plans are all part of an integrated approach for the management, operation and maintenance of the Pemaco remedial action. In addition, the ability to easily access operation and sampling data via the project team web site will facilitate treatment system optimization, and enable the project managers and operators to immediately respond to permit excursions.

Compliance monitoring for Pemaco RA includes vapor effluent monitoring in accordance with SCAQMD protocol and water effluent monitoring in accordance with SDLAC permit.

9.1 VAPOR DISCHARGE GUIDANCE

Emission standards and requirements for the vapor treatment system effluent are based on health risk analyses by the SCAQMD as part of the EPA's goal of meeting the substantive requirements of the air permitting process. The FTO system, used for the destruction of VOCs at the Pemaco Site, meets and exceeds the SCAQMD effluent requirements (see Sections 3.2 and 3.3). Analytical results showing compliance with the vapor guidance documents are presented in Table 3.14.

EPA has a policy that CERLCA response actions are exempted by law from the requirement to obtain Federal, State or local permits related to any activities conducted on the CERCLA site (OSWER Directive 9355.7-03). It also is EPA's policy to assure all activities conducted on sites are protective of human health and the environment. Therefore, the EPA coordinated and consulted with SCAQMD to assure compliance with the Risk Assessment Procedures for Rules 1401 and 212.

For a remediation project involving a FTO in the South Coast Basin, the applicable rules are those that fall under Regulation IV and Rules 1303 and 1304 under Regulation XIII. Rule 1166, which applies to all VOC-contaminated soil handing, is also relevant. Rule 1303 under Regulation XIII pertains to Best Available Control Technology (BACT). These guidelines indicate that FTOs (or "afterburners" as they are referred to in permit documents), which is the BACT for VOCs, are required to operate with a residence time greater than or equal to 0.3 seconds at a temperature greater than or equal to 1,400 degrees Fahrenheit (^{o}F). The FTO far exceeds this requirement. The BACT for NOx, SOx, and PM10 is natural gas usage. For this particular project, NOx, SOx, carbon monoxide (CO), and PM10 emissions are exempted from offset requirements based on R134(c)(4). Only VOC emissions are subject to this Rule and, therefore, should not exceed the 55 pounds per day or 4 tons/year threshold at the current rate of VOC emission. In 2007, a maximum emission rate of 3.50E-03 pounds of VOCs per day (9/5/07) was calculated for the treatment system. As described in Section 3.2, the dioxin and furan concentrations in 2007 ranged from one (1) to three (3) orders of magnitude below the NESHAP limit of 2.00E-04 µg/dscm.

The SCAQMD is responsible for issuing air permits that typically govern all vapor treatment equipment emissions. The air permits are issued, and required monitoring levels are prescribed based on the overall human health risk posed by the combined emissions of all contaminants in the vapor stream. Vapor guidance information is provided in Appendix 5. The procedures for determining human health risks from air emissions sources are outlined in the SCAQMD Risk Assessment Procedures for Rules 1401 and 212. To comply with Rules 1401 and 212, the human health risk from the emission source must be less than that rate calculated to cause cancer in 1 person out of 100,000; or a cancer risk of 1E-05. Calculated hazard indices must also be less than 1.

A Tier 2 Screening Risk Assessment Model was used to calculated risk from the highest concentrations of dioxin/furan and VOCs measured at the treatment plant stack during the source testing on July 12, 2007. The Tier 2 Risk Assessment is a standard numerical model used to determine exposure and risk from an emission source, in accordance with SCAQMD Rules 1401 and 212. The model calculates health risks according to the probability that a person will contract cancer due to inhalation of TACs in vapor effluents. The following assumptions were used to calculate the risk at 60, 75, and 125 meters from the stack:

- The highest concentrations of dioxins and VOCs measured at the stack during the source testing on 7/12/07;
- The point source is from treatment equipment operating 24 hour per day, 7 days of the week;
- The source is from a stack with a height of greater than24 feet and less than 49 feet;
- A daily breathing rate of 302 liters/kilogram-day; and
- SCAQMD listed dispersion factors for calculating the annual average 24 hours per day TAC concentrations in air.

An acceptable level of cancer risk is considered to be one in 100,000 according to the SCAQMD however, the EPA has established an acceptable level of cancer risk to be one in a 1,000,000. The results of the risk assessment are shown below:

VOCs and Dioxins/Furans Exposure Scenarios	Fence Property Line	Nearest Receptor	Park Property Line
Distance from Stack:	**60 meters**	**75 meters**	**125 meters**
Total Maximum Individual Caner Risk	4.06E-08	2.02E-08	1.70E-08
Total Chronic Hazard Index	2.34E-05	1.16E-05	9.79E-06
Total Acute Hazard Index	1.20E-09	6.48E-10	5.46E-10

As shown in the table above, the risk associated with potential exposure to TACs at the three distances are less than one-in-a-million. Both acute and chronic hazardous indexes from potential exposure to non-cancer TACs at the three distances are less than 1. The treatment system emissions are 47 to 427 times lower than would be allowable under the NESHAP program. NESHAP's standard for dioxin and furans is 2.00E-04 µg/dscm.

9.2 Sewer Discharge Permit

To evaluate compliance with the sewer discharge permit, grab samples are collected and preserved from SP-209 once per three (3) months in accordance with 40 CFR 136 and analyzed by a laboratory that is certified by either the District or the State Department of Health

Services. Samples are analyzed for the following parameters: COD, suspended solids, pH, dissolved sulfide, lead, oil and grease, and VOCs. For unstable parameters such as COD, TSS, and lead 24-hr composite samples are required by the permit. The total wastewater flow rate and peak wastewater flow rate must also be included on the self-monitoring form provided in Appendix 5. The self-monitoring form is a requirement of the sewer discharge permit number 16961) issued by the SDLAC Industrial Waste Section located in Whittier, CA.

The emission limits of VOCs and SVOCs are calculated by adding the concentrations of the organics that are individually present at concentrations greater than 10 ug/L (see Table 4.6). Analytical results for water effluent samples collected at SP-209 are summarized in Table 4.6.

The current operating scenario indicates that discharge will be kept, on average; two orders of magnitude below the sewer permit discharge limits for VOCs which is 1,000 µg/L. County Sanitation District No. 2 of Los Angeles County, Industrial Waste Section sampling requirements are performed in accordance with the sewer discharge permit.

The Pemaco treatment plant discharges were within the permit requirements. VOC discharges were two (2) to three (3) orders of magnitude less than the discharge limit of 1,000 µg/L in 2007 as discussed in Section 4.2. Quarterly sewer discharge summaries are sent to the EPA for report preparation purposes. Copies of these summaries are included in Appendix 6.

.

10.0 WASTE MANAGEMENT

The operation of the extraction and treatment system generates general solid wastes and potentially hazardous wastes. During operation, TN&A and its subcontractors are responsible for managing California-, CERLA-, and Resource Conservation and Recovery Act- (RCRA)-regulated wastes in accordance with procedures outlined in the WMP. The WMP describes the waste management activities and procedures that are used to handle waste disposal. TN&A conducts a waste management assessment to document that waste activities are in compliance with site procedures and California, CERCLA, and RCRA regulations.

TN&A is responsible for oversight of the waste management activities to ensure compliance with all requirements for regulated wastes. TN&A is also responsible for approving the waste disposal contractor acquisition, costs or waste disposal, and determining of the type of analytical testing needed for disposal of the waste.

The EPA is responsible for receiving ownership of regulated wastes and signing for EPA applicable paperwork and analytical results to facilitate compliance with off-site shipping and disposal. Copies of all manifests and disposal information is provided in Appendix 6.

10.1 EXAMPLES OF WASTE STREAMS

The following types of potentially hazardous waste are generated from the operation and maintenance of the treatment system:

- Spent carbon from vapor and water treatment;
- Bag filters from the liquid process line;
- Partially-filled and empty containers of oil used for maintenance;
- Paint cans and aerosol spray cans; and
- Absorbent pads used for cleaning up small leaks and spills.

The following types of general waste are generated from the operation and maintenance of the treatment system:

- Trash and rubbish generated by site housekeeping;
- Used personal protective equipment (PPE);
- Disposable sampling equipment;
- Metal and plastic pipe, electrical materials (wire, etc.); and
- Miscellaneous wastes (trash, food containers, etc.).

Wastes are segregated into regulated and non-regulated streams to minimize generation and disposal of hazardous waste and material.

10.2 WASTE MANIFESTS AND DISPOSAL

Haz Mat Trans, Inc., the waste disposal subcontractor, is hired to dispose of wastes generally within 30 days of collection. The waste disposal subcontractor provides services including, but not limited to, preparation of manifests, transportation and disposal of wastes. TN&A is responsible for potentially hazardous waste profiling and the EPA is responsible for signing all manifests.

Potentially hazardous solid and liquid wastes generated during O&M activities are managed under Title 40 Code of Federal Regulations 261.31 to 261.33. Non-hazardous and hazardous wastes generated during O&M activities are disposed of in an EPA-approved Subtitle C landfill. Information on the GAC and filter bag waste disposal sites is provided below:

GAC	Filter Bags
Kettleman Hills Facility Chemical Waste Management, Inc. EPA ID: CAT000646117 35251 Old Skyline Road PO Box 471 Kettleman City, CA 93239	Siemens Water Technologies Corp. EPA ID: CAD097030993 5375 South Boyle Avenue Vernon, CA 90058

In the future, the following EPA-approved waste disposal facilities may be utilized:

Hazardous and Non-Hazardous Solid Wastes	Liquid Wastes
Clean Harbors Buttonwillow Facility EPA ID CAD980675276 2500 West Lokem Road Buttonwillow, CA 93206	DeMenno-Kerdoon Facility EPA ID: CAT080013352 200 N. Alameda Street Compton, CA

TN&A has secured approval from the EPA for each of the above-listed waste disposal facilities. TN&A is responsible for coordinating signing of manifests for all wastes with the EPA.

10.3 OFF-SITE WASTE TRANSPORTATION AND DISPOSAL

The EPA pre-approved all off-site disposal facilities during the waste profiling process. Only properly licensed waste haulers can be used for off-site transportation of non-hazardous solid wastes.

Trucks are scheduled to arrive and depart through the District Boulevard gates at off-peak residential traffic times. Morning truck arrivals are scheduled prior to or after the 07:00 – 08:30 peak hours and afternoon departures are scheduled prior to 15:30.

Generally, waste transport trucks are within parking area in front of the office, and are not expected to become contaminated. The trucks pass briefly through the adjacent residential neighborhood, but then travel on Slauson Avenue, a mixed commercial/industrial street before exiting to the 710 Freeway.

10.4 RECORD KEEPING

TN&A maintains all manifests and records of all waste materials removed from the site. Please refer to Table 10.1 for the waste GAC disposal summary and the waste filter bag disposal summary.

The records include the following items:

- Signed wastes manifests and weigh tickets for non-hazardous waste shipments (per federal and state regulations)
- Receipts and/or bills of lading for general solid waste
- Exception reports, in the event that a manifest copy is not received within 35 days of shipment initiation

- Land disposal restriction notification
- Information on labeling, packaging, marking, and placarding of waste shipments

The TN&A Site Manager maintains a binder at the Site field office trailer exclusively for waste transfer activities and provides copies to the EPA. Non-hazardous wastes (soil, liquids) transported, treated, stored, or disposed of must be recorded and reported. At the specified time, TN&A will forward, to the EPA RPM or designee a submittal in the proper form and format to allow the RPM to file a California State Annual or EPA biennial report. The information will contain TN&A's company name, contract number and project location.

11.0 PROJECT DATA COMMUNICATIONS

A communications plan was developed to specify how project issues will be communicated among the project team members and with EPA/USACE. In general, a number of planned conference calls and summary reports are distributed that facilitate coordination of the project team. The project team website supports team communications and allows the team to obtain all pertinent data pertaining to the project. A procedure has also been developed to address unplanned issues and problems.

11.1 PROJECT WEBSITE

The Pemaco project website serves as a work environment where internal and external participants come together as a cohesive team. All data generated through system monitoring as well as environmental data (e.g. groundwater chemical data and vapor data) is accessible to the project team via the website. The website functions as a secure virtual office space with all of the tools and facilities necessary for the project team members to stay up to date on developments and to interact with one another. Some of the useful tools available on the project website include: a bulletin board, a calendar, events and announcements, an online library of relevant historical materials, operational materials, reports, graphics, animations, interactive maps, and interactive schematics.

11.2 SCHEDULED AND UNSCHEDULED COMMUNICATIONS

Scheduled communications consists of those activities that are scheduled on a daily, weekly, or monthly basis to communicate project progress. Communication primarily consists of teleconferences and summary reports. These communications include the following:

- Daily Field Call: The TN&A Site Manager facilitates a daily field call each weekday with each of the Project Engineer (as shown on the Organization Chart, Figure 1.4). The purpose of the field call is to review recent occurrences, to review work to be performed during the upcoming day, and to review data to be collected. This call is also used to emphasize items of particular concern or issues warranting close attention.
- Daily QC Reports: The TN&A Site Manager prepares a daily report at the end of each weekday that summarizes data collection and field activities for the current day. This daily report is uploaded to the website by 9:00 am on the following weekday (the Friday report will be uploaded by 9:00 am the following Monday). An example daily report is provided as Table 11.1.
- Weekly Team Conference Call: A weekly conference call is held for the extended project team, including all site Operators and Managers. The purpose of this call is to confirm that all aspects of the project are properly communicated among the project team. The agenda of the call addresses: 1) Work completed during the previous week, 2) Work planned for the upcoming week and priorities, 3) Staffing issues, 4) Equipment status, and 5) Changes in system operations and/or schedule.
- Weekly ERH Summary Report: A PDF summary report is uploaded to the project team website each week that provides a quick overview of the previous week's ERH activities, existing problems or issues, and charts and figures that track the progress of the thermal remediation. The report includes an energy balance, energy use, and temperatures profiles. The report is produced by TRS and approved by the TN&A Project Manager prior to distribution and upload to the web site.

- Weekly QC Report: A weekly QC report is provided to EPA and USACE on Monday of each week. The primary purpose of this report is to provide a summary of the week's operations and to forecast for the next week. Items requiring immediate attention are always e-mailed as they are identified, but reminders of the issues are included in the weekly management report.
- Operations Summary: This is a brief report recapping the critical element change of the project such as lead carbon vessel change, equipment replacement, system shutoff resolution, and manifold operations. Operation summary is updated by the TN&A Site Manager on a daily basis and distributed by email to EPA and USACE along with the daily report. Operation summary also records system runtime, filter bag usage, salt usage, and chlorine usage to help the Site Manger and Project Engineer to track the O&M efficiency. An example of the operations summary is provided as Table 11.2.
- 3-Week Project Schedule: A 3-week project schedule is provided to EPA and USACE on the weekly team conference call. The schedule assists Managers in foreseeing the work planned for the upcoming week and priorities. An example of the 3-week schedule is provided as Table 11.3.
- Weekly ERH Summary Report: A PDF summary report is uploaded to the project team website each week that provides a quick overview of the previous week's ERH activities, existing problems or issues, and charts and figures that track the progress of the thermal remediation. The report includes an energy balance, energy use, and temperatures profiles. The report is produced by TRS and approved by the TN&A Project Manager prior to distribution and upload to the web site.

Copies of these reports are provided in Appendix 7.

Time-critical issues and items will be communicated to USACE as they are identified, typically by e-mail since this allows the project team to be copied on important communications. These items will include health and safety issues, updates on equipment repair and/or replacement, early notices on potential problems, and status updates of urgent items in progress.

As-needed teleconferences will be conducted to address specific scope items to confirm that the project team understands the issue. As issues are identified that require modification to equipment or processes in the field, an additional form will be completed to communicate the required modifications. The time-critical issues will be summarized in the weekly management report as a reminder of the status of each item.

12.0 HEALTH AND SAFETY MANAGEMENT

All work performed at the Pemaco Superfund Site is accomplished in a manner that protects the health and safety of the workers and environment, and complies with all applicable federal, state, local, and employer requirements. This section provides an overview of the management system for implementing safety requirement and ensuring a safe work environment. Detail related to specific health and safety requirements and procedures are not included in this plan, but are defined in the TN&A's Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP), and Accident Hazards Analysis (AHAs) provided by TRS (for ERH) and ERM, the builder of the extraction and treatment system.

TN&A is ultimately responsible for ensuring that all work performed for USACE and EPA at the site is performed safely and in accordance with federal, state, and local requirements. As part of this responsibility, TN&A communicated applicable health and safety requirements to all site subcontractors, provided oversight and inspections of site activities, and ensured compliance with such requirements. TN&A will provide direction to all site personnel to correct unsafe or noncompliance acts or conditions. Material Safety Data Sheets pertaining to all the chemicals used in the treatment plant are available on Site.

TN&A is responsible for establishing methods by which work will be performed to ensure a safe work environment that complies with all applicable requirements. TN&A's role is detailed below:

- Inspect and/or provide all required personal protective equipment, exposure monitoring equipment and instruments, area posting and control signs and barriers, and other associated health and safety supplies,
- Plan and perform all work using an Integrated Safety Management System (ISMS) process described in the MOMP (TN&A, 2007) equivalent to the model applied throughout USACE sites,
- Act as a designated and qualified safety professional for the project and work with the operations team in performing activity hazard analysis, determining appropriate safety controls, prescribing personal protective monitoring equipment, performing and documenting personnel exposure monitoring, and assisting with any required investigation and analysis of work related accidents, injuries, or near misses. During routine operation of the remediation process system, an individual with health and safety experience commensurate with the process hazards has been designated as the health and safety competent person,
- Maintain and communicate a policy whereby every individual on site has the authority to stop work if imminently unsafe conditions exist,
- Develop a Site Safety and Health Plan (SSHP),
- Develop an AHA for all major activities associated with fulfilling the scope of work,
- Notify the Project Manger immediately of any work-related accident resulting in personnel injury or illness, environmental spill or release of regulated material, near miss occurrence, or other event that would require report in accordance with USACE requirements, and

- Ensure that any emergency response actions related to their activities or involving their personnel are conducted in accordance with applicable site-specific SSHPs and procedures.

12.1 HEALTH AND SAFETY DOCUMENTS

TN&A maintains a corporate Health and Safety Manual as the primary document that describes TN&A's commitment to worker protection and defines specific policies related to worker health and safety. This manual is structured to provide standards for routine hazards and associated controls related to general industry and construction hazards.

To implement the health and safety standards for the Pemaco site, a site-specific APP/SSHP was written to provide the framework for day-to-day implementation of the health and safety program.

TRS also has SSHPs that address the hazards and controls associated with the ERH work. These SSHPs at a minimum meet the requirements of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response". The subcontractors' SSHPs are subordinate to and will not conflict with the TN&A SSHP for activities at Pemaco.

Health and safety activities will be formally documented. Among the types of records included are:

- Record of the tailgate safety meeting,
- AHAs,
- Access control logs,
- Training records,
- Medical records,
- Exposure monitoring data,
- Instrument calibration data,
- Various safety work permits,
- Routine inspection reports,
- Safety inspections, and
- SSHPs and procedures

TN&A ensures that copies of all health and safety documents are readily available at the Site, in the office, and that they are distributed to the USACE and the EPA.

12.2 EMERGENCY RESPONSE ACTIONS

Emergencies within the scope of this document may include accidents or releases of chemicals, fires, or natural events such as a flood, earthquake, or other natural disaster. The site-specific APP/SSHPs and ERP contain personnel responsibilities and actions required by TN&A and subcontractors in the event of such emergency.

13.0 SECURITY AND SITE ACCESS CONTROL

Access to the Site is restricted and controlled to mitigate health and safety, and environmental hazards to the public, workers, and environment; limit access to authorized and/or trained personnel and escorted visitors; and to control the physical assets of EPA, TN&A and their subcontractors.

TN&A is responsible for site controls associated with the exclusion and contaminant reduction zones and the TN&A field office, project work areas, and associated structures. All persons entering the Pemaco work area must sign the TN&A sign-in-log and receive a safety briefing commensurate with the areas they access and the work activities.

Security and site access controls are documented through TN&A's SSHP. TN&A provides oversight, inspection and access-controlled fencing and gates to control the boundaries of the area under remediation.

A control zone is established within the remediation area and thus, personnel are required to have specific training and/or PPE prior to access. Access control and Occupational Safety and Health Administration (OSHA) required warnings and informational signs designate limited access areas. Hazard communication, safety briefings, training, and access sign-in and sign-out logs are documented and reviewed for compliance.

A double-beam security system with interlocks and alarms was installed to prevent entry of unauthorized persons to the ERH area. The ERH system and power supply will automatically shut down if an intrusion occurs for safety and security reasons. An extended fence was also installed along the bike path to discourage unauthorized entry to the Site.

A security guard is present on site after normal work hours and 24 hours a day during weekends and holidays. The security guard is instructed to first call the police for intruders; fire department in case of fire; TN&A in case of equipment malfunction. The presence of the security guard and extensive warning signs has resulted in no break-ins or thefts since ERH since ERH system startup.

14.0 REFERENCES

J&H, P.C., 2007. *Draft Operation and Maintenance Manual*, Pemaco Superfund Site, Maywood, California, 19 July.

Thermal Remediation Services, Inc. (TRS), 2006. *Final Work Plan for In Situ Thermal Remediation (Electrical Resistance Heating)*, Pemaco Superfund Site, Maywood, California 90270. 21 September.

TN&A, 2006. *Final Remedial Design Report*, Pemaco Superfund Site, Maywood, California, August.

TN&A, 2007. *Accident Prevention Plan*, Pemaco Superfund Site, Maywood, California, August.

TN&A, 2007. *Construction Completion Report*, Pemaco Superfund Site, Maywood, California, 30 September.

TN&A, 2007. *Emergency Response Actions*, Pemaco Superfund Site, Maywood, California, October.

TN&A, 2007. *Environmental Protection Plan*, Pemaco Superfund Site, Maywood, California, October.

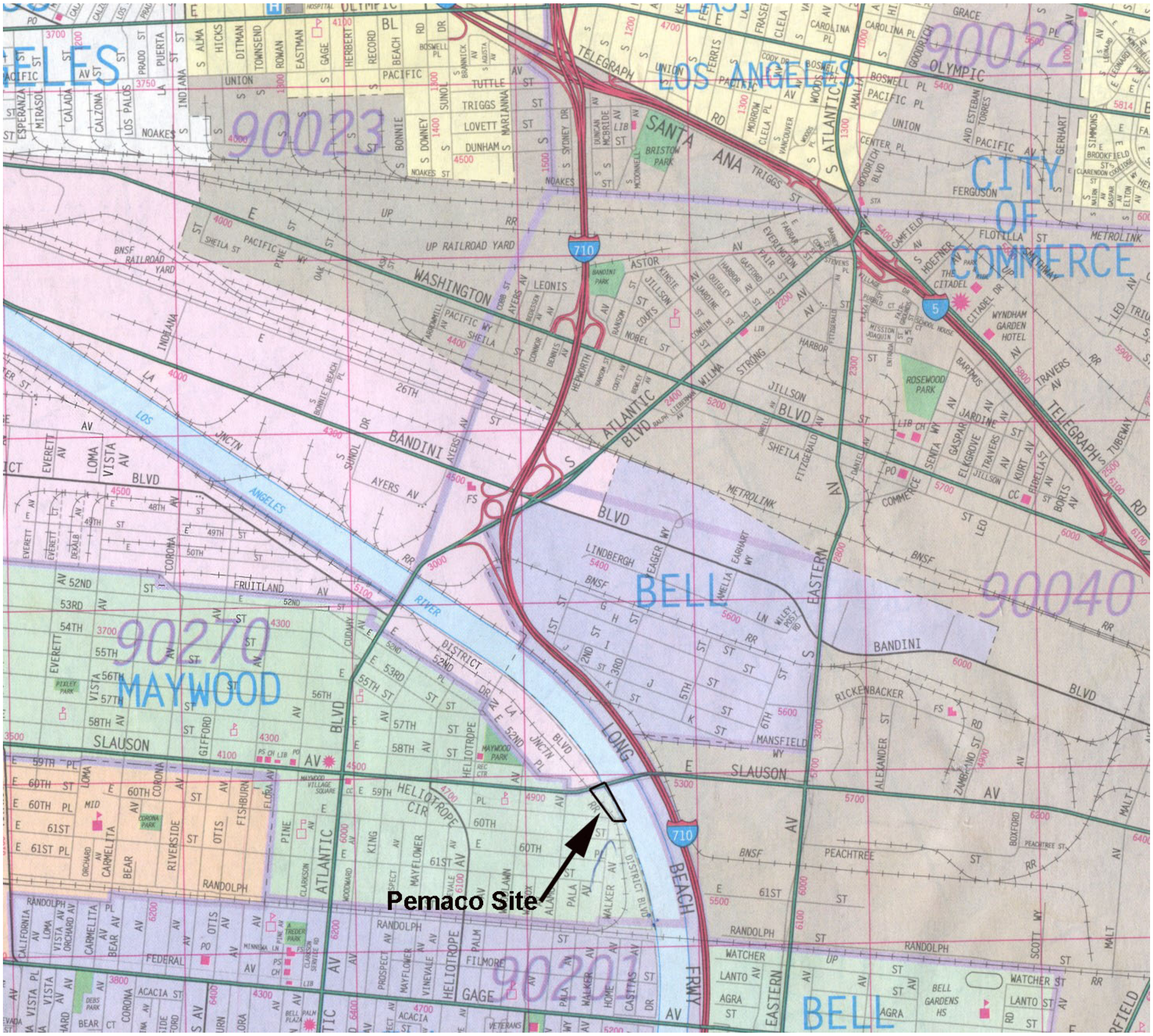
TN&A, 2007. *Monitoring Operations and Maintenance Plan*, Pemaco Superfund Site, Maywood, California, October.

TN&A, 2007. *Sampling and Analysis Plan*, Pemaco Superfund Site, Maywood, California, October.

TN&A, 2007. *Waste Management Plan*, Pemaco Superfund Site, Maywood, California, February.

EPA, 2005. Record of Decision for Pemaco Maywood Superfund Site, Maywood, California. EPA ID: CAD980737092. 13 January.

FIGURES

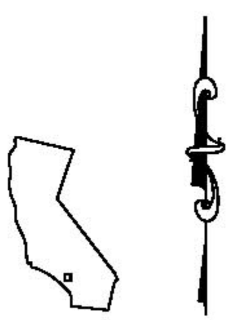


1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

SCALE 1:24000

LEGEND



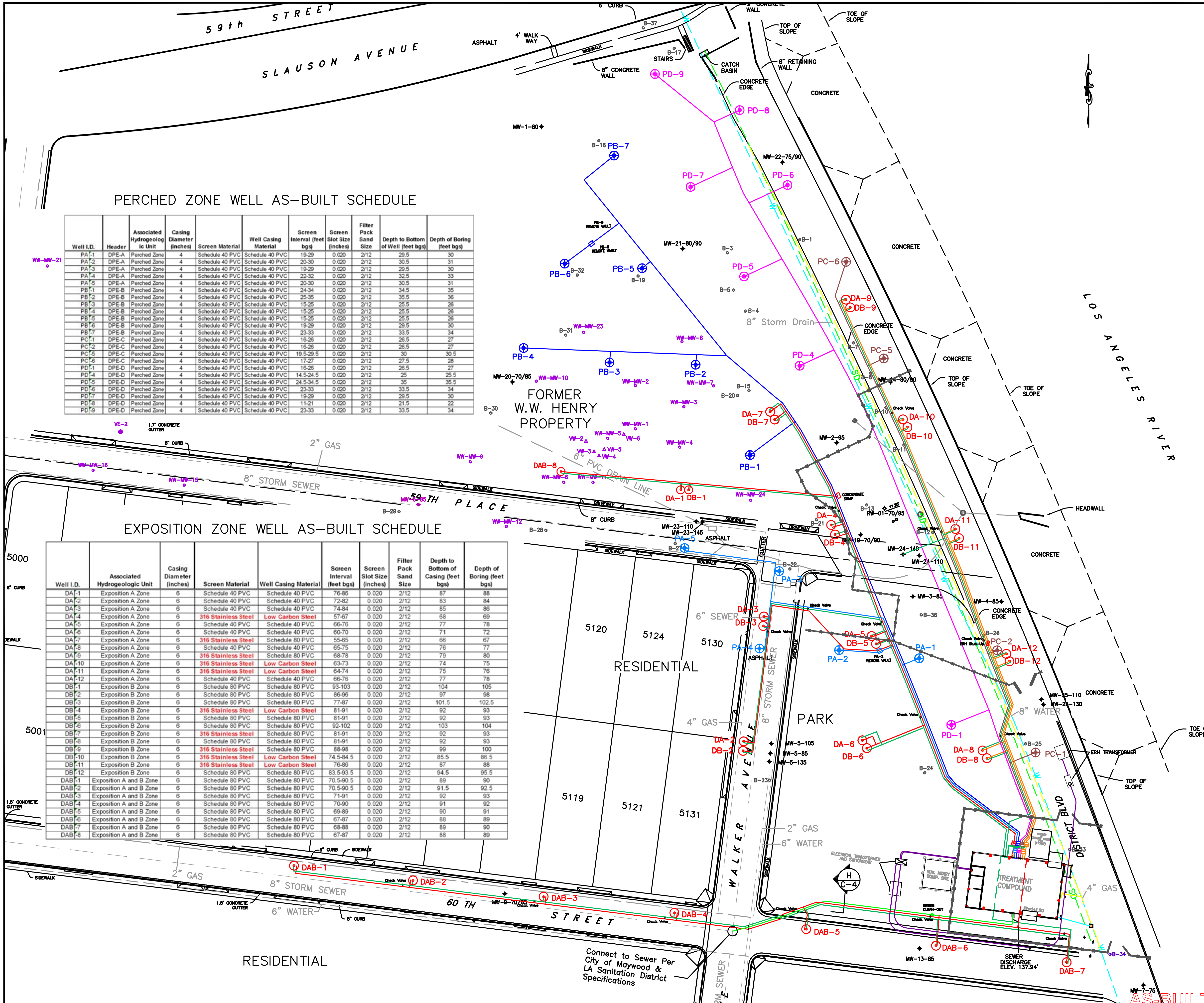
DATE:	FILE NAME:	APPROVED BY:
11/5/2000	PEMACO-SL	

SITE LOCATION MAP

PEMACO, INC.
MAYWOOD, CALIFORNIA

TN & A — T N & Associates, Inc. Engineering and Science

FIGURE 1.1



PERCHED ZONE WELL AS-BUILT SCHEDULE

Well I.D.	Header	Associated Hydrogeologic Unit	Casing Diameter (inches)	Screen Material	Well Casing Material	Screen Interval (feet bgs)	Screen Slot Size (inches)	Filter Pack Sand Size	Depth to Bottom of Well (feet bgs)	Depth of Boring (feet bgs)
PA-1	DPE-A	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	19-29	0.020	2/12	29.5	30
PA-2	DPE-A	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	20-30	0.020	2/12	30.5	31
PA-3	DPE-A	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	19-29	0.020	2/12	29.5	30
PA-4	DPE-A	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22-32	0.020	2/12	32.5	33
PA-5	DPE-A	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	20-30	0.020	2/12	30.5	31
PB-1	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	24-34	0.020	2/12	34.5	35
PB-2	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	25-35	0.020	2/12	35.5	36
PB-3	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	15-25	0.020	2/12	25.5	26
PB-4	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	15-25	0.020	2/12	25.5	26
PB-5	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	15-25	0.020	2/12	25.5	26
PB-6	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	19-29	0.020	2/12	29.5	30
PB-7	DPE-B	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	23-33	0.020	2/12	33.5	34
PC-1	DPE-C	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	16-26	0.020	2/12	26.5	27
PC-2	DPE-C	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	16-26	0.020	2/12	26.5	27
PC-5	DPE-C	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	19.5-29.5	0.020	2/12	30	30.5
PC-6	DPE-C	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	17-27	0.020	2/12	27.5	28
PD-1	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	16-26	0.020	2/12	26.5	27
PD-4	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	14.5-24.5	0.020	2/12	25	25.5
PD-5	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	24.5-34.5	0.020	2/12	35	35.5
PD-6	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	23-33	0.020	2/12	33.5	34
PD-7	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	19-29	0.020	2/12	29.5	30
PD-8	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	11-21	0.020	2/12	21.5	22
PD-9	DPE-D	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	23-33	0.020	2/12	33.5	34

EXPOSITION ZONE WELL AS-BUILT SCHEDULE

Well I.D.	Associated Hydrogeologic Unit	Casing Diameter (inches)	Screen Material	Well Casing Material	Screen Interval (feet bgs)	Screen Slot Size (inches)	Filter Pack Sand Size	Depth to Bottom of Casing (feet bgs)	Depth of Boring (feet bgs)
DA-1	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	76-86	0.020	2/12	87	88
DA-2	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	72-82	0.020	2/12	83	84
DA-3	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	74-84	0.020	2/12	85	86
DA-4	Exposition A Zone	6	316 Stainless Steel	Low Carbon Steel	57-67	0.020	2/12	68	69
DA-5	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	66-76	0.020	2/12	77	78
DA-6	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	60-70	0.020	2/12	71	72
DA-7	Exposition A Zone	6	316 Stainless Steel	Schedule 80 PVC	55-65	0.020	2/12	66	67
DA-8	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	65-75	0.020	2/12	76	77
DA-9	Exposition A Zone	6	316 Stainless Steel	Schedule 80 PVC	68-78	0.020	2/12	79	80
DA-10	Exposition A Zone	6	316 Stainless Steel	Low Carbon Steel	63-73	0.020	2/12	74	75
DA-11	Exposition A Zone	6	316 Stainless Steel	Low Carbon Steel	64-74	0.020	2/12	75	76
DA-12	Exposition A Zone	6	Schedule 40 PVC	Schedule 40 PVC	66-76	0.020	2/12	77	78
DB-1	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	93-103	0.020	2/12	104	105
DB-2	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	86-96	0.020	2/12	97	98
DB-3	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	77-87	0.020	2/12	101.5	102.5
DB-4	Exposition B Zone	6	316 Stainless Steel	Low Carbon Steel	81-91	0.020	2/12	92	93
DB-5	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	81-91	0.020	2/12	92	93
DB-6	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	92-102	0.020	2/12	103	104
DB-7	Exposition B Zone	6	316 Stainless Steel	Schedule 80 PVC	81-91	0.020	2/12	92	93
DB-8	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	81-91	0.020	2/12	92	93
DB-9	Exposition B Zone	6	316 Stainless Steel	Schedule 80 PVC	88-98	0.020	2/12	99	100
DB-10	Exposition B Zone	6	316 Stainless Steel	Low Carbon Steel	74.5-84.5	0.020	2/12	85.5	86.5
DB-11	Exposition B Zone	6	316 Stainless Steel	Low Carbon Steel	76-86	0.020	2/12	87	88
DB-12	Exposition B Zone	6	Schedule 80 PVC	Schedule 80 PVC	83.5-93.5	0.020	2/12	94.5	95.5
DAB-1	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	70.5-90.5	0.020	2/12	89	90
DAB-2	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	70.5-90.5	0.020	2/12	91.5	92.5
DAB-3	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	71-91	0.020	2/12	92	93
DAB-4	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	70-90	0.020	2/12	91	92
DAB-5	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	69-89	0.020	2/12	90	91
DAB-6	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	67-87	0.020	2/12	88	89
DAB-7	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	68-88	0.020	2/12	89	90
DAB-8	Exposition A and B Zone	6	Schedule 80 PVC	Schedule 80 PVC	67-87	0.020	2/12	88	89

LEGEND:

- DAB-5 — EXTRACTION WELL SCREENED THROUGH BOTH 'A' AND 'B' ZONES
- DA-1 DB-1 — EXTRACTION WELL WITH INDIVIDUAL SCREENS FOR THE 'A' AND 'B' ZONES
- P15-D — PERCHED ZONE WELL
- B-6 — PEMACO WELL, EXISTING MONITORING WELL, PERCHED ZONE (<35 FEET BGS)
- MW-2 — PEMACO WELL, EXISTING MONITORING WELL, EXPOSITION AQUIFER
- RW-01 — PEMACO WELL, EXISTING RECOVERY WELL LOCATION
- WW-MW-5 — W.W. HENRY WELL, EXISTING GROUNDWATER MONITORING WELL
- VW-6 — W.W. HENRY WELL, EXISTING DPE WELL – DEEP, INTERMEDIATE AND SHALLOW
- VE-3 — W.W. HENRY WELL, EXISTING SVE WELL
- SEWER DISCHARGE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING GAS LINE
- FENCE LINE
- C.S. CONDENSATE SUMP
- G.W. GROUNDWATER SUMP

PERCHED ZONE PIPING:

LIGHT BLUE	DPE-A	5 WELLS (PA-1 TO PA-5) WEST TRENCH
DARK BLUE	DPE-B	7 WELLS (PB-1 TO PB-7) WEST TRENCH
BROWN	DPE-C	4 WELLS (PC-1, PC-4 TO PC-6) WEST TRENCH
PURPLE	DPE-D	7 WELLS (PD-1, PD-4 TO PD-9) EAST TRENCH

EXPOSITION ZONE PIPING:

GREEN 1	GW-1	7 WELLS (DAB-1 TO DAB-7) SOUTH TRENCH
GREEN 2	GW-2	15 WELLS (DAB-8, DA/DB-1 TO DA/DB-7) WEST TRENCH
GREEN 3	GW-3	11 WELLS (DA/DB-8 TO DA/DB-12, MW-24-140) EAST TRENCH
RED 1	VE-1	7 WELLS (DAB-1 TO DAB-7) SOUTH TRENCH
RED 2	VE-2	15 WELLS (DAB-8, DA/DB-1 TO DA/DB-7) WEST TRENCH

ERH AREA PIPING:

ORANGE	ERH, VE-3 EAST TRENCH 6 DEEP WELLS (DA/DB-8 TO DA/DB-10), ERH WELLS TBD BY ERH SUBCONTRACTOR
ORANGE	ERH, VE-4 EAST TRENCH 4 DEEP WELLS (DA/DB-11 TO DA/DB-12), ERH WELLS TBD BY ERH SUBCONTRACTOR

NOTES:

1. THE TRENCH NETWORK IS COMPRISED OF THREE MAIN TRENCHES REFERRED TO IN THE DRAWINGS AND SPECIFICATIONS AS THE EAST, WEST AND SOUTH TRENCHES.
2. INSTALL WELLS ACCORDING TO SCHEDULES SHOWN ON THIS DRAWING. FINAL DEPTH AND SCREEN INTERVALS SHALL BE DETERMINED BY THE INSTALLING GEOLOGIST OR ENGINEER BASED ON THE OBSERVED DEPTH OF THE TARGET INTERVAL.
3. TRENCH AND WELL LOCATIONS HAVE BEEN POSITIONED SO AS TO NOT INTERFERE WITH MAYWOOD PARK CONSTRUCTION LINES, GRADES AND DRAINAGE STRUCTURES. REPOSITIONING OF WELLS, PIPES OR TRENCHES SHALL BE COORDINATED WITH THE CITY OF MAYWOOD AND THE PARK CONTRACTOR.

0 40 80
APPROXIMATE SCALE IN FEET

PEMACO WELL FIELD MAP

PEMACO SUPERFUND SITE
5050 EAST SLAUSON AVENUE
MAYWOOD, CALIFORNIA

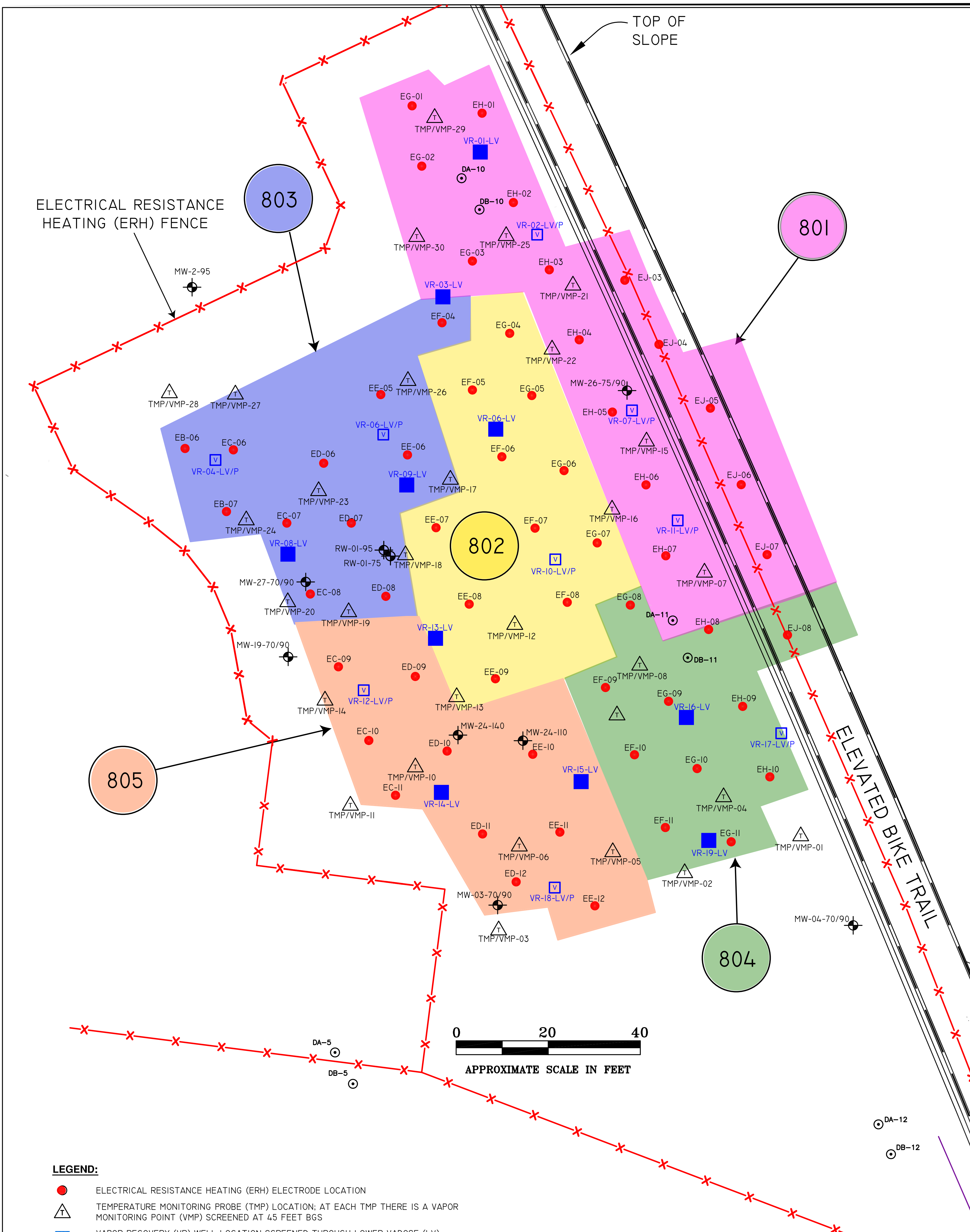
PREPARED FOR:
U.S. Environmental Protection Agency
Region IX
San Francisco, California

PREPARED BY:
T N & Associates, Inc.
Engineering and Science

SCALE: AS SHOWN
DESIGNED: JW & GN
DRAWN: CBG
CHECKED: JW

APPROVED
AS BUILTS

DATE: 12/11/07
FIGURE 1.2
REV 0



LEGEND:

- ELECTRICAL RESISTANCE HEATING (ERH) ELECTRODE LOCATION
- TEMPERATURE MONITORING PROBE (TMP) LOCATION; AT EACH TMP THERE IS A VAPOR MONITORING POINT (VMP) SCREENED AT 45 FEET BGS
- VAPOR RECOVERY (VR) WELL LOCATION SCREENED THROUGH LOWER VADOSE (LV) AND PERCHED (P) ZONE
- VAPOR RECOVERY (VR) WELL LOCATION SCREENED THROUGH LOWER VADOSE (LV)
- DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- EXISTING MONITORING WELL LOCATION
- ELECTRICAL RESISTANCE HEATING (ERH) AREA

NOTES:

1. THERMAL REMEDIATION SERVICES, INC. SURFACE PIPING IS NOT SHOWN.

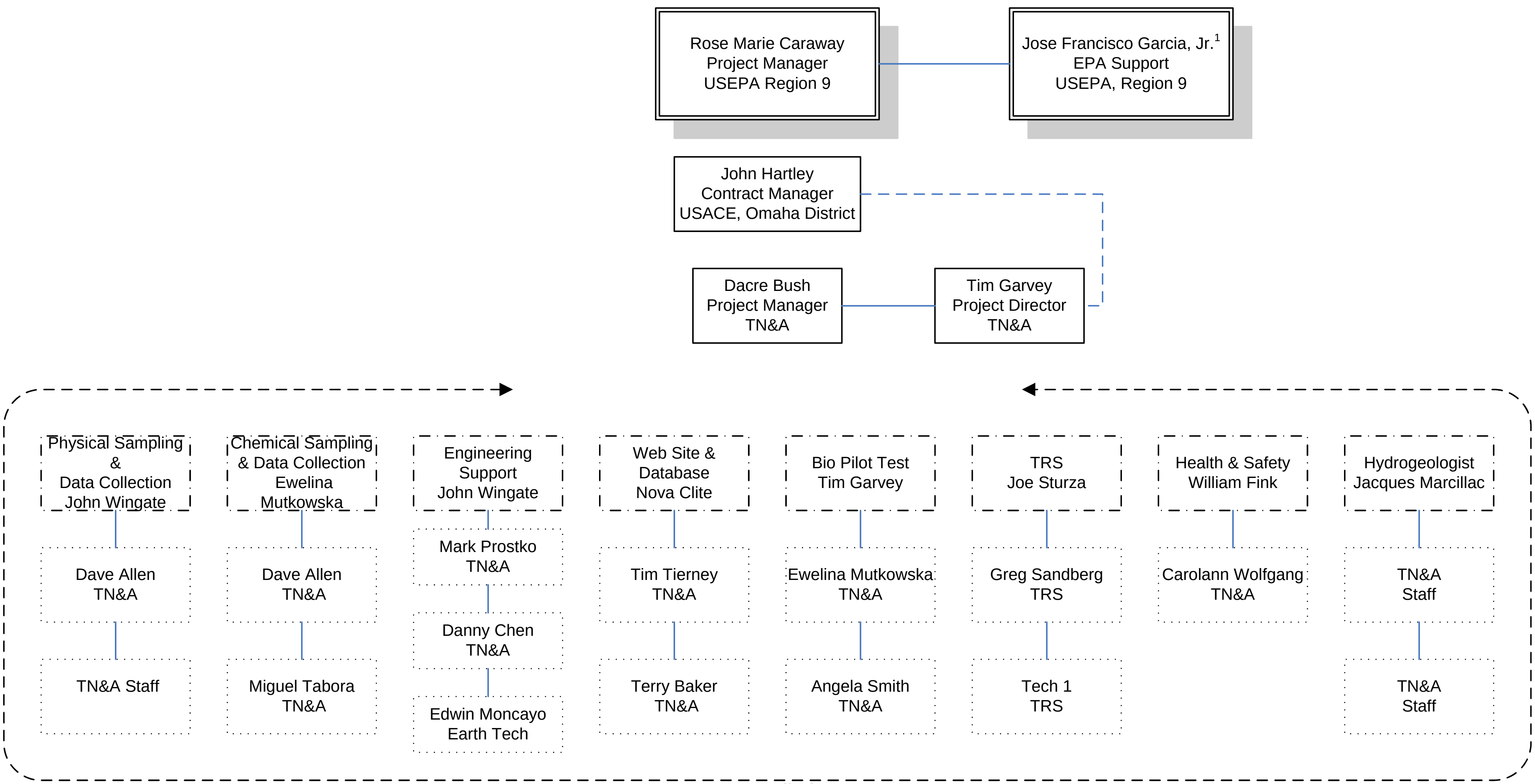
ELECTRICAL RESISTANCE HEATING (ERH) AREA

PEMACO SUPERFUND SITE
5050 EAST SLAUSON AVENUE
MAYWOOD, CALIFORNIA

PREPARED FOR:	PREPARED BY:
U.S. Environmental Protection Agency Region IX San Francisco, California	TN&A T N & Associates, Inc. Engineering and Science

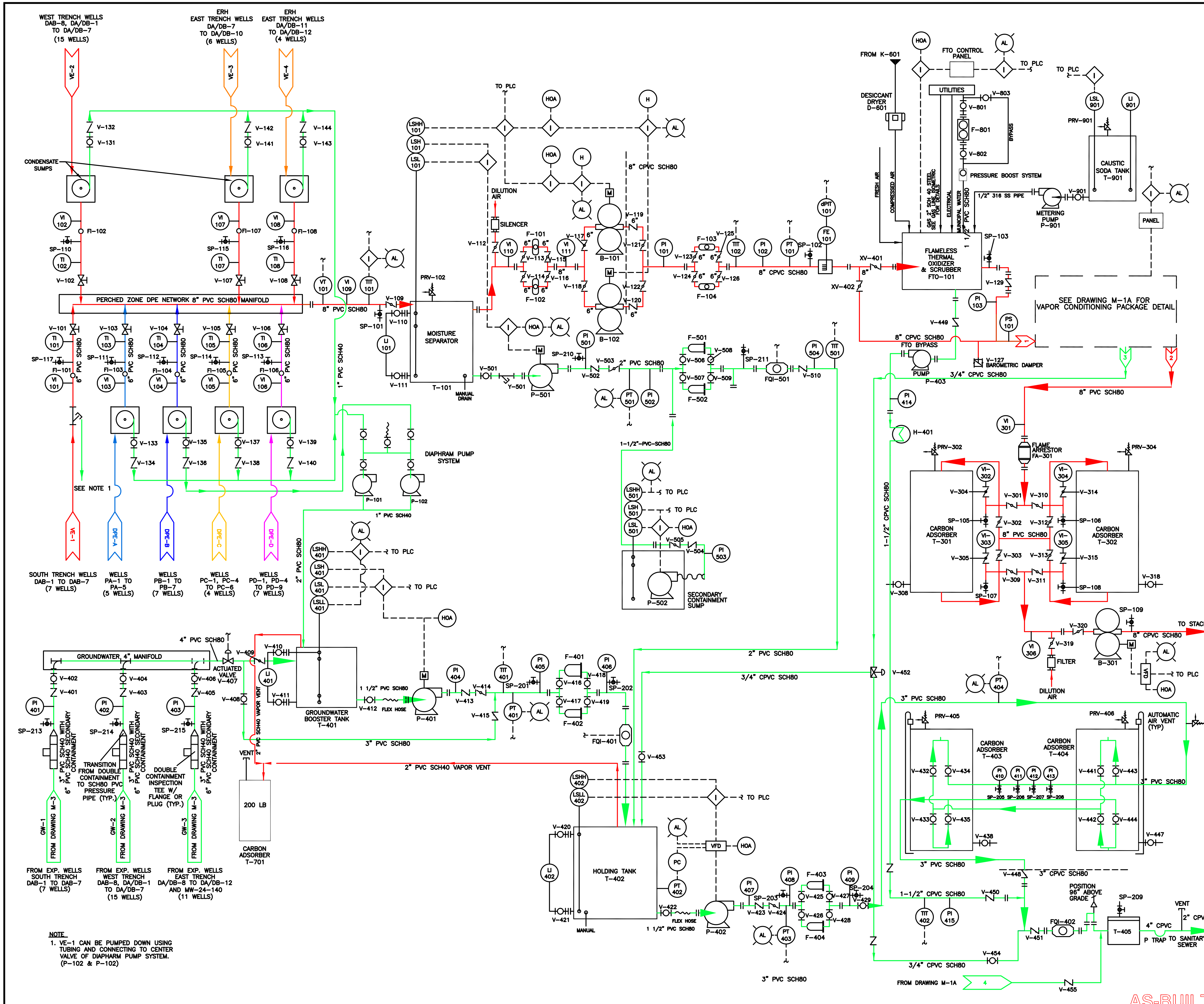
SCALE: AS SHOWN	APPROVED	DATE: 09/19/07
DESIGNED: TRS		FIGURE 1.3
DRAWN: TRS & TN&A		
CHECKED: PB & JW		

Figure 1.4
Organizational Chart
Pemaco Superfund Site, Maywood, California



Pemaco Remediation Team

[1] Role Occupied for the first half of 2007 by Alheli Banos.



LEGEND:

- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- DIAPHRAGM VALVE
- VALVE WITH ACTUATOR
- VALVE WITH SOLENOID
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- VACUUM BREAKER (ANTI-SIPHON)
- ELECTRIC MOTOR
- FLOW TOTALIZER & INDICATOR
- VALVED SAMPLE PORT
- SYSTEM INTERLOCK/FAILSAFE
- ELECTRICAL
- ELECTRICAL REPORTING TO PLC
- VENT
- LONG TURN TEE WYE
- FLEX HOSE
- AIR FILTER
- REGULATOR W/ PRESSURE GAUGE
- ALARMS
- HEATING COIL
- COOLING FANS
- FLANGE
- UNION
- HEAT EXCHANGER
- CAM AND GROOVE COUPLINGS–ALUMINUM
- CLEAN–OUT WYE
- AVERAGING PITOT TUBE
- FLAME ARRESTOR
- AUTOMATIC AIR VENT
- MULTIPLE BAG FILTER HOUSING
- SINGLE BAG FILTER HOUSING
- CALCIUM FILTER

ABBREVIATIONS:

AL	ALARM
CV	CONTROL VALVE
dPIT	DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FM	FLOW METER
FQI	FLOW TOTALIZER
GALV	GALVANIZED
HOA	HAND–OFF AUTO
LAH	LEVEL ALARM HIGH
LACSD	LOS ANGELES COUNTY SANITATION DIVISION
LI	LEVEL INDICATOR
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH–HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW–LOW
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
PS	PRESSURE SWITCH
SP	SAMPLE PORT
SS	STAINLESS STEEL
TI	TEMPERATURE INDICATOR
TIT	TEMPERATURE INDICATOR TRANSMITTER
VI	VACUUM INDICATOR
VT	VACUUM TRANSMITTER
VFD	VARIABLE FREQUENCY DRIVE

NOTES:

1. A SUMMARY OF PROCESS EQUIPMENT DESCRIPTIONS AND SPECIFICATIONS ARE SHOWN ON THIS DRAWING. REFER TO TABLE 4-11 - EQUIPMENT AND INSTRUMENT SPECIFICATION SUMMARY AND TABLE 4-12 - MAJOR EQUIPMENT SPECIFICATIONS FOR MORE DETAILS ON FANS,BLOWERS,PUMPS, VAPOR PHASE CARBON ADSORPTION UNITS, FLAMELESS THERMAL OXIDATION SYSTEM AND FILTRATION SYSTEMS.
2. PLEASE SEE SPECIFICATION SECTION 13405 - PROCESS LOGIC CONTROL FOR PLC DESIGN, INTERLOCKS, ALARMS, AND CONTROL REQUIREMENS AND SPECIFICATIONS.
3. INSTALLATION OF PIPING SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH ATTACHMENT 2 IN THE RFP AND SPECIFICATION SECTION 15400-PROCESS PIPING.
4. ALL ELECTRICAL WIRING SHALL CONFORM TO SPECIFICATION DIVISION 16 - ELECTRICAL.
5. CONTROL PANELS FOR EACH TREATMENT PROCESS SHALL BE DESIGNED AND POSITIONED ON THE EQUIPMENT IT CONTROLS BY THE MANUFACTURER.
6. TREATMENT EQUIPMENT SHALL BE PLACED IN ACCORDANCE WITH THE TREATMENT COMPOUND PROCESS LAYOUT ON DRAWING M-4.
7. ALL PIPING AND CONDUITS SHALL BE SUPPORTED, IN ACCORDANCE WITH LOCAL CODES, TO PREVENT SAGGING OR OVER-STRESSING OF THE PIPE AND CONNECTIONS. ALL PIPING SHALL BE SUPPORTED SO THAT NO LOAD OR STRESS IS TRANSFERRED TO ANY EQUIPMENT.
8. PROCESS PIPING SHALL BE LABELED WITH FLOW DIRECTION AND CONTENT AT ALL ABOVE GROUND VALVES.
9. WHERE PIPING IS ROUTED ABOVE GROUND (INSIDE THE COMPOUND) THE PIPING SHALL BE SUPPORTED BY UNISTRUT AND SHALL BE INSTALLED PER LOCAL CODE AND PIPE MANUFACTURER GUIDELINES.
10. UTILITY PIPING MUST BE INSTALLED PER LOCAL CODE.
11. ALL PROCESS PIPING BENEATH ROADS SHALL BE A MINIMUM OF SCHEDULE 40.
12. SECONDARY CONTAINMENT PIPING AND ELECTRICAL CONDUIT, WHERE REQUIRED, SHALL BE A MINIMUM OF SCHEDULE 40.
13. SUMP PUMP P-502 HOSES, ELECTRICAL, AND CONTROLS MUST BE CONFIGURED FOR QUICK REMOVAL FROM SECONDARY CONTAINMENT SUMP.
14. CAUSTIC PUMP P-901 WILL BE PROVIDED BY ANGUIL AND WILL BE INSTALLED BY CONTRACTOR AS PART OF THIS SCOPE.
15. FINAL DESIGN OF VAPOR CONDITIONING PACKAGE SHALL BE DETERMINED BY TREATMENT SYSTEM CONTRACTOR.

GENERAL PIPING AND INSTRUMENTATION DIAGRAM

PEMACO SUPERFUND SITE
5050 EAST SLAUSON AVENUE
MAYWOOD, CALIFORNIA

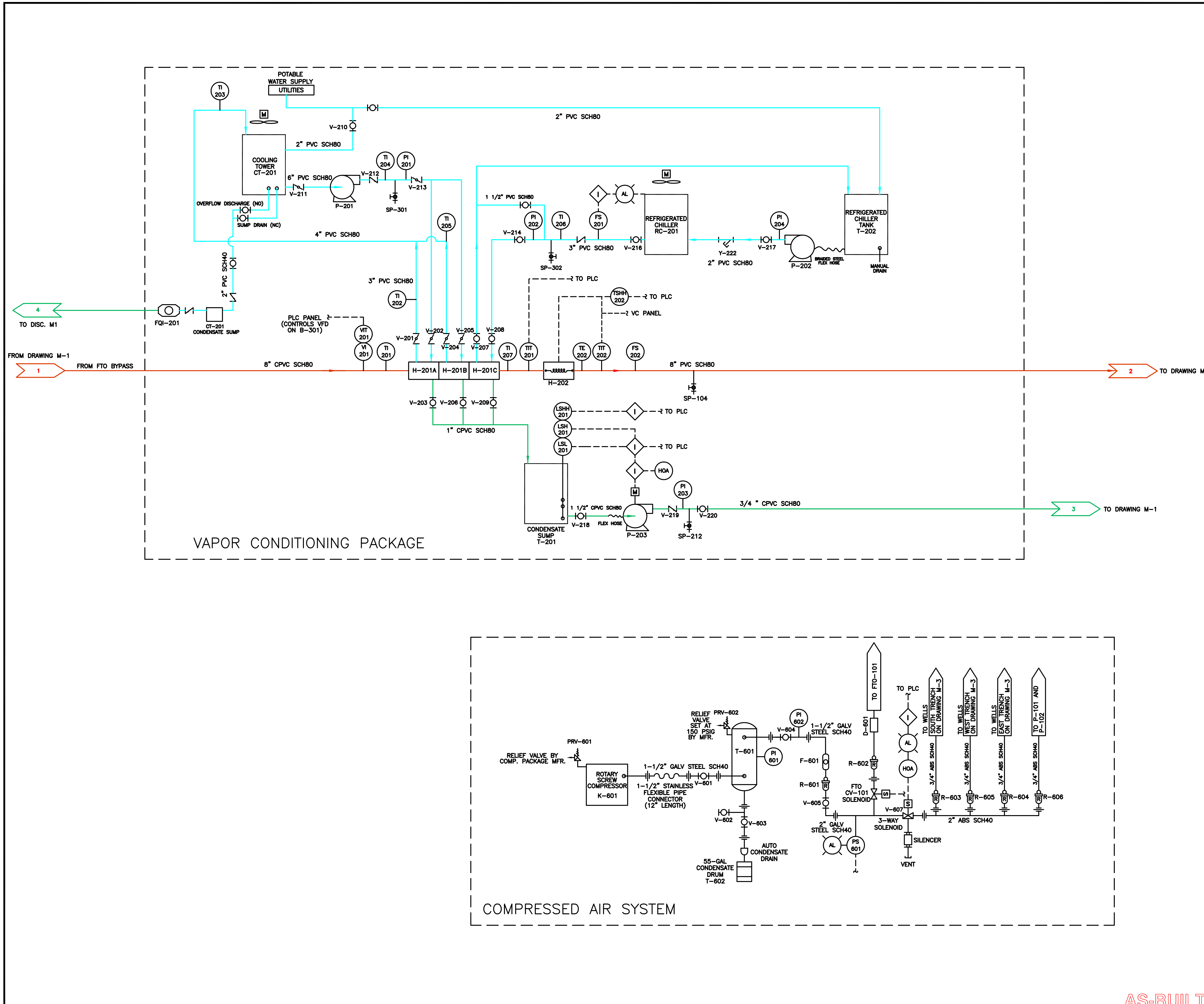
PREPARED FOR:
U.S. Environmental Protection Agency
Region IX
San Francisco, California

PREPARED BY:
TN&A T N & Associates, Inc.
Engineering and Science

SCALE: AS SHOWN
DESIGNED: MB, JW & LL
DRAWN: DC & JBP
CHECKED: JW

APPROVED
AS BUILTS

DATE: 05/29/2007
FIGURE 2.1



LEGEND:

- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- DIAPHRAGM VALVE
- VALVE WITH ACTUATOR
- VALVE WITH SOLENOID
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- VACUUM BREAKER (ANTI-SIPHON)
- ELECTRIC MOTOR
- FLOW TOTALIZER & INDICATOR
- VALVED SAMPLE PORT
- SYSTEM INTERLOCK/FAILSAFE
- ELECTRICAL
- ELECTRICAL REPORTING TO PLC
- VENT
- LONG TURN TEE WYE
- FLEX HOSE
- AIR FILTER
- REGULATOR W/ PRESSURE GAUGE
- ALARMS
- HEATING COIL
- COOLING FANS
- FLANGE
- UNION
- HEAT EXCHANGER
- CAM AND GROOVE COUPLINGS–ALUMINUM
- CLEAN–OUT WYE
- AVERAGING PITOT TUBE
- FLAME ARRESTOR
- AUTOMATIC AIR VENT
- MULTIPLE BAG FILTER HOUSING
- SINGLE BAG FILTER HOUSING

ABBREVIATIONS:

AL	ALARM
CV	CONTROL VALVE
dPIT	DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FM	FLOW METER
FQI	FLOW TOTALIZER
GALV	GALVANIZED
HOA	HAND–OFF AUTO
LAH	LEVEL ALARM HIGH
LACSD	LOS ANGELES COUNTY SANITATION DIVISION
LI	LEVEL INDICATOR
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH–HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW–LOW
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
PS	PRESSURE SWITCH
SP	SAMPLE PORT
SS	STAINLESS STEEL
TI	TEMPERATURE INDICATOR
TIT	TEMPERATURE INDICATOR TRANSMITTER
VI	VACUUM INDICATOR
VT	VACUUM TRANSMITTER
VFD	VARIABLE FREQUENCY DRIVE

NOTES:

1. A SUMMARY OF PROCESS EQUIPMENT DESCRIPTIONS AND SPECIFICATIONS ARE SHOWN ON THIS DRAWING. REFER TO TABLE 4-11 - EQUIPMENT AND INSTRUMENT SPECIFICATION SUMMARY AND TABLE 4-12 - MAJOR EQUIPMENT SPECIFICATIONS FOR MORE DETAILS ON FANS,BLOWERS,PUMPS, VAPOR PHASE CARBON ADSORPTION UNITS, FLAMELESS THERMAL OXIDATION SYSTEM AND FILTRATION SYSTEMS.
2. PLEASE SEE SPECIFICATION SECTION 13405 - PROCESS LOGIC CONTROL FOR PLC DESIGN, INTERLOCKS, ALARMS, AND CONTROL REQUIREMENS AND SPECIFICATIONS.
3. INSTALLATION OF PIPING SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH ATTACHMENT 2 IN THE RFP AND SPECIFICATION SECTION 15400-PROCESS PIPING.
4. ALL ELECTRICAL WIRING SHALL CONFORM TO SPECIFICATION DIVISION 16-ELECTRICAL.
5. CONTROL PANELS FOR EACH TREATMENT PROCESS SHALL BE DESIGNED AND POSITIONED ON THE EQUIPMENT IT CONTROLS BY THE MANUFACTURER.
6. TREATMENT EQUIPMENT SHALL BE PLACED IN ACCORDANCE WITH THE TREATMENT COMPOUND PROCESS LAYOUT ON DRAWING M-4.
7. ALL PIPING AND CONDUITS SHALL BE SUPPORTED, IN ACCORDANCE WITH LOCAL CODES, TO PREVENT SAGGING OR OVER-STRESSING OF THE PIPE AND CONNECTIONS. ALL PIPING SHALL BE SUPPORTED SO THAT NO LOAD OR STRESS IS TRANSFERRED TO ANY EQUIPMENT.
8. PROCESS PIPING SHALL BE LABELED WITH FLOW DIRECTION AND CONTENT AT ALL ABOVE GROUND VALVES.
9. WHERE PIPING IS ROUTED ABOVE GROUND (INSIDE THE COMPOUND) THE PIPING SHALL BE SUPPORTED BY UNISTRUT AND SHALL BE INSTALLED PER LOCAL CODE AND PIPE MANUFACTURER GUIDELINES.
10. UTILITY PIPING MUST BE INSTALLED PER LOCAL CODE.
11. ALL PROCESS PIPING BENEATH ROADS SHALL BE A MINIMUM OF SCHEDULE 40.
12. SECONDARY CONTAINMENT PIPING AND ELECTRICAL CONDUIT, WHERE REQUIRED, SHALL BE A MINIMUM OF SCHEDULE 40.
13. FINAL DESIGN OF VAPOR CONDITIONING PACKAGE SHALL BE DETERMINED BY TREATMENT SYSTEM CONTRACTOR.

GENERAL PIPING AND INSTRUMENTATION DIAGRAM
VAPOR CONDITIONING PACKAGE & COMPRESSED AIR SYSTEM

PEMACO SUPERFUND SITE
5050 EAST SLAUSON AVENUE
MAYWOOD, CALIFORNIA

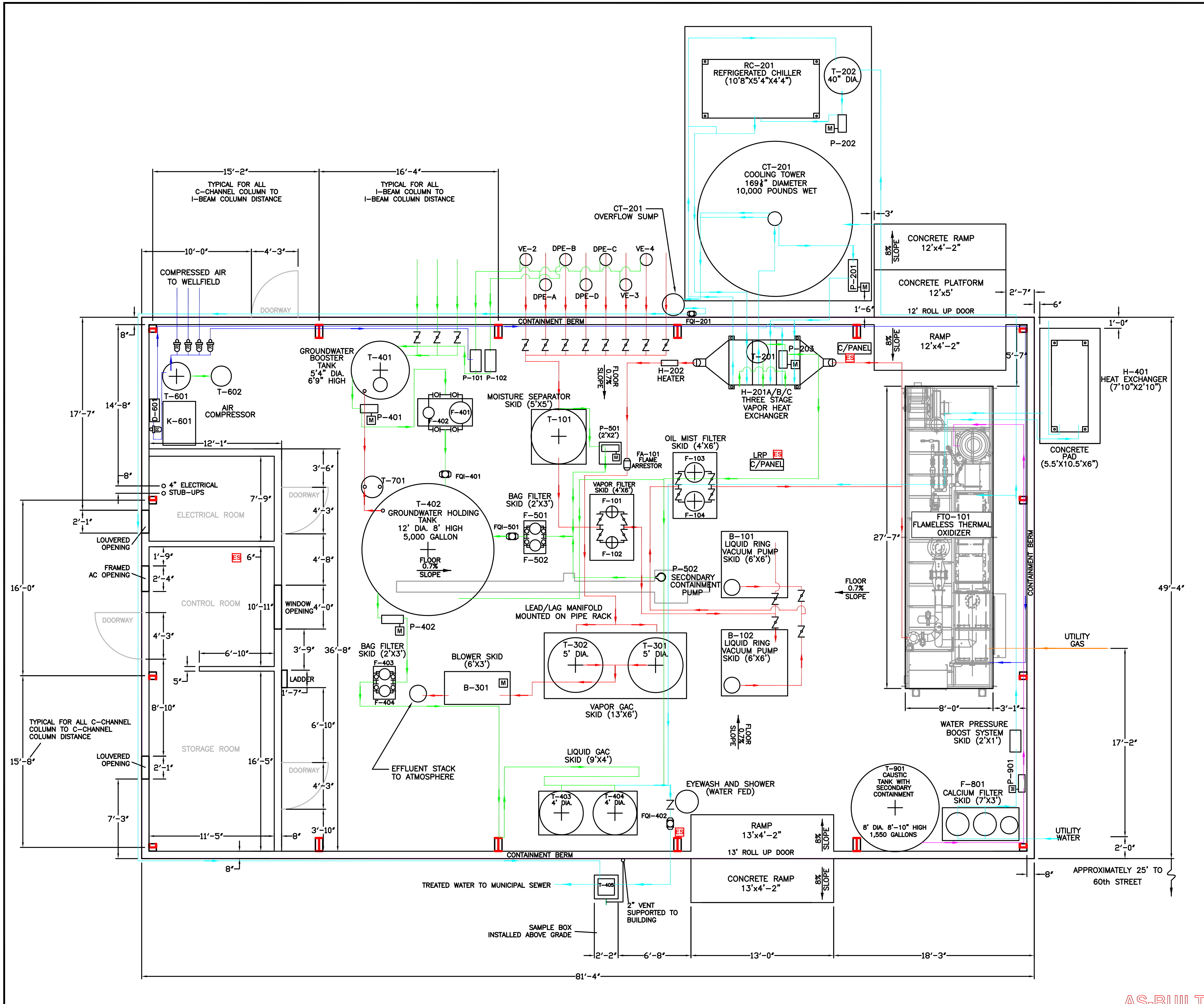
PREPARED FOR:
U.S. Environmental Protection Agency
Region IX
San Francisco, California

PREPARED BY:
T N & Associates, Inc.
Engineering and Science

SCALE: AS SHOWN
DESIGNED: MB, JW & LL
DRAWN: DC & JBP
CHECKED: JW

APPROVED
AS BUILTS

DATE: 05/29/2007
FIGURE
2.2



LEGEND:

- I-BEAM COLUMN
- C-CHANNEL COLUMN
- UTILITY GAS
- UTILITY WATER/DRAINAGES
- TREATED WATER
- ES EMERGENCY STOP

DRAFT NOTES:

1. THE INTENT OF THIS DRAWING IS TO SHOW EQUIPMENT LAYOUT. REFER TO DRAWING M-1 FOR THE PROCESS AND INSTRUMENTATION DIAGRAM.
2. TREATMENT EQUIPMENT SHALL BE PLACED AS SHOWN IN THIS DRAWING. NECESSARY MODIFICATIONS TO LAYOUT DUE TO ACCESS, MAINTENANCE ETC.. MUST BE APPROVED BY PROJECT ENGINEER.
3. ALL EQUIPMENT AND SKIDS SHALL BE BOLTED ONTO CONCRETE SLAB. ALL SLAB CONNECTIONS SHALL BE SUBJECT TO INSPECTION ACCORDING TO SPECIFICATION SECTION 01452-SPECIAL INSPECTION FOR SEISMIC-RESISTING SYSTEMS. ITEMS WHICH CANNOT BE SKID MOUNTED SHALL BE SIMILARLY MOUNTED OR RESTRAINED BY CABLE OR WALL BRACES AND SUBJECT TO THE SAME SPECIAL INSPECTION FOR SEISMIC-RESISTING SYSTEMS.
4. TREATMENT COMPOUND FOUNDATION SHALL BE CONSTRUCTED AS SHOWN IN DRAWINGS C-12 AND C-13. CHANGES TO THE FOUNDATION DESIGN MAY BE REQUIRED BASED ON THE PRE-ENGINEERED METAL BUILDING CONTRACTOR'S DESIGN.
5. TREATMENT COMPOUND BUILDING IS A PRE-ENGINEERED METAL STRUCTURE THAT SHALL BE CONSTRUCTED ACCORDING TO DRAWING C-11 AND SPECIFICATION SECTION 13120-PRE-ENGINEERED METAL BUILDINGS.
6. REFER TO SPECIFICATION DIVISION 08-DOORS AND WINDOWS, DIVISION 11-TREATMENT COMPONENTS, DIVISION 13-STRUCTURAL COMPONENTS AND PROCESS CONTROL, DIVISION 15-PLUMBING AND DIVISION 16-ELECTRICAL FOR DETAILS ON TREATMENT COMPOUND CONSTRUCTION.
7. CONTRACTOR SHALL EXERCISE DUE CARE TO PROTECT EQUIPMENT FROM THEFT OR DAMAGE.
8. INTERNAL PIPING AND CONVEYANCE SYSTEMS SHALL BE LOCATED OVERHEAD (8' MINIMUM) OR BENEATH THE CONCRETE SLAB TO ALLOW FORKLIFT ACCESS TO INDIVIDUAL SKIDS.
9. INSTALLATION OF ALL PIPING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 15400-PROCESS PIPING. UTILITY PIPING MUST BE INSTALLED PER LOCAL CODE.
10. ALL PIPING AND CONDUIT SUPPORTS (NOT SHOWN) SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES TO PREVENT SAGGING OR OVER-STRESSING OF THE PIPE AND CONNECTIONS. ALL PIPING SHALL BE SUPPORTED SO THAT NO LOAD OR STRESS IS TRANSFERRED TO ANY EQUIPMENT.
11. PROCESS PIPING AND VALVES SHALL BE LABELED WITH FLOW DIRECTION AND CONTENT AT ALL ABOVE GROUND LOCATIONS.
12. FINAL DESIGN OF VAPOR CONDITIONING PACKAGE SHALL BE DETERMINED BY TREATMENT SYSTEM CONTRACTOR.

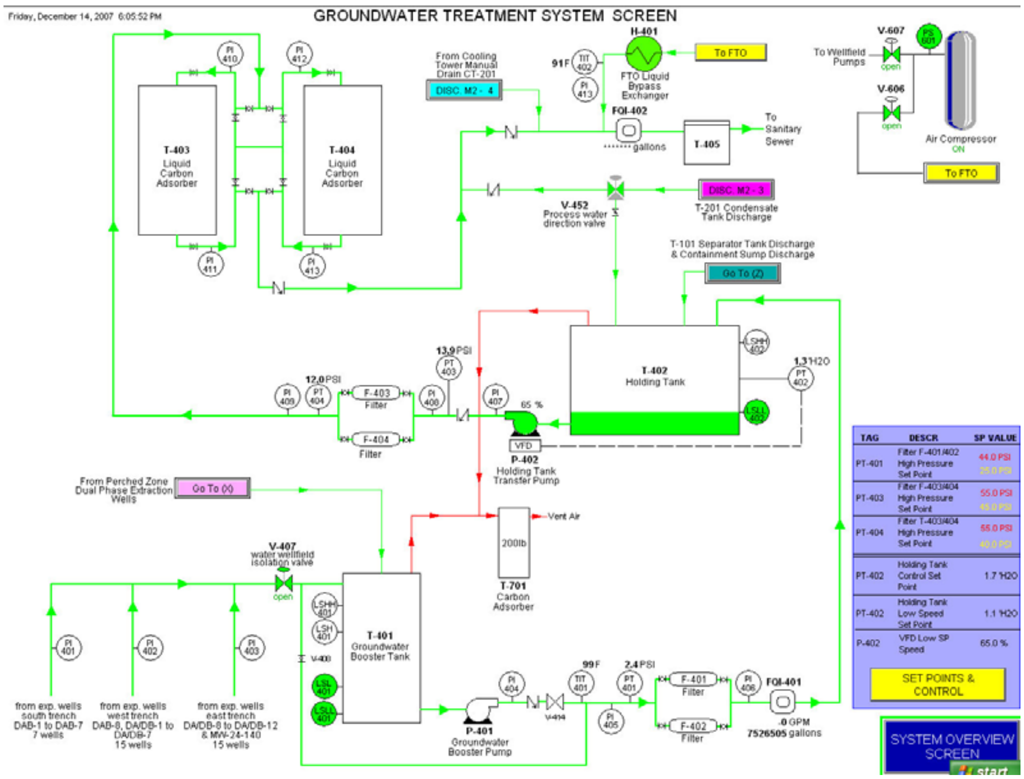
0 4 8
APPROXIMATE SCALE IN FEET

TREATMENT COMPOUND PROCESS LAYOUT

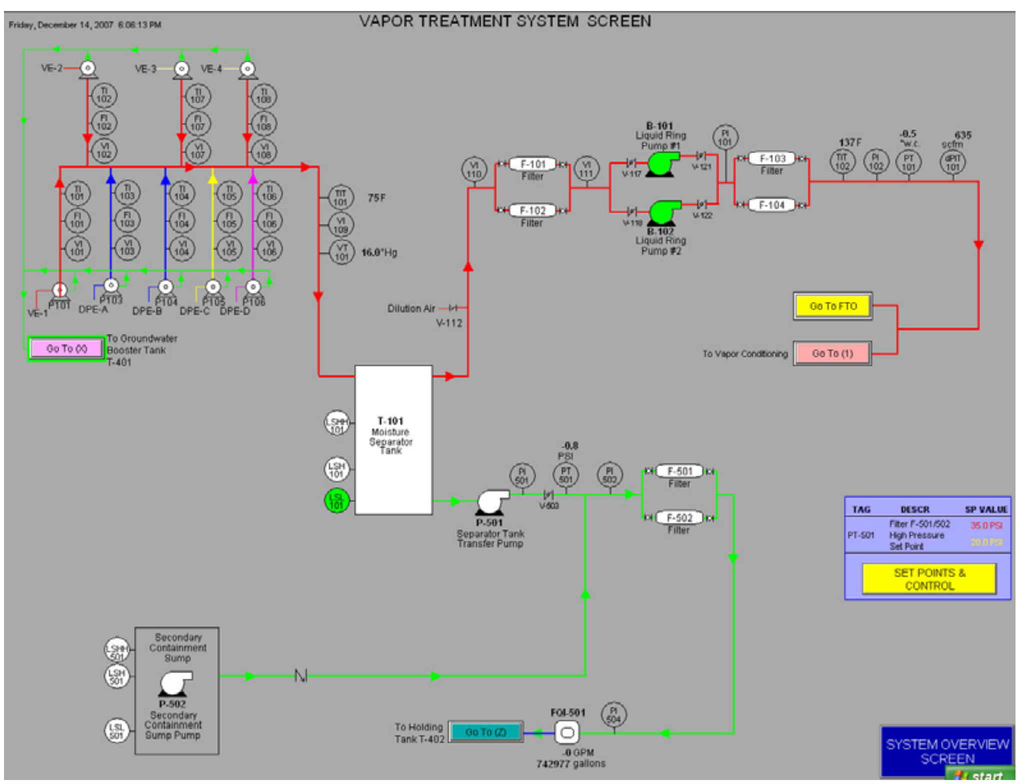
PEMACO SUPERFUND SITE
5050 EAST SLAUSON AVENUE
MAYWOOD, CALIFORNIA

PREPARED FOR: U.S. Environmental Protection Agency Region IX San Francisco, California	PREPARED BY: T N & Associates, Inc. Engineering and Science

SCALE: AS SHOWN	APPROVED AS BUILTS	DATE: 05/29/2007
DESIGNED: JW & DC DRAWN: DC & JBP CHECKED: JW		FIGURE 2.3



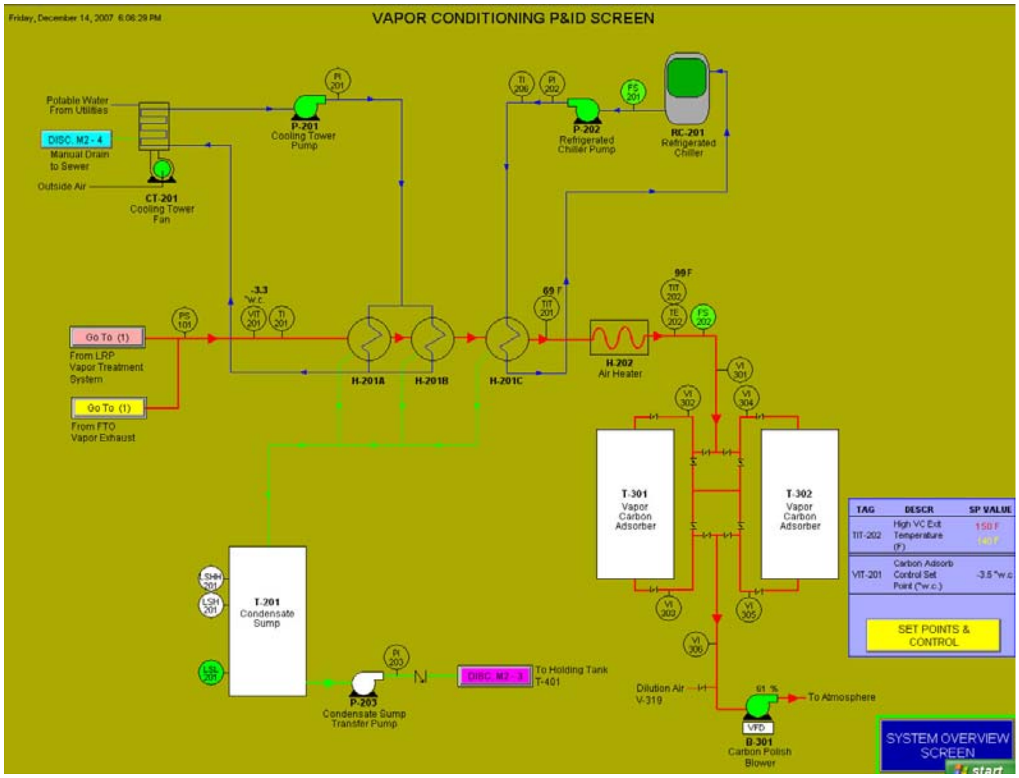
Groundwater Treatment System Screen



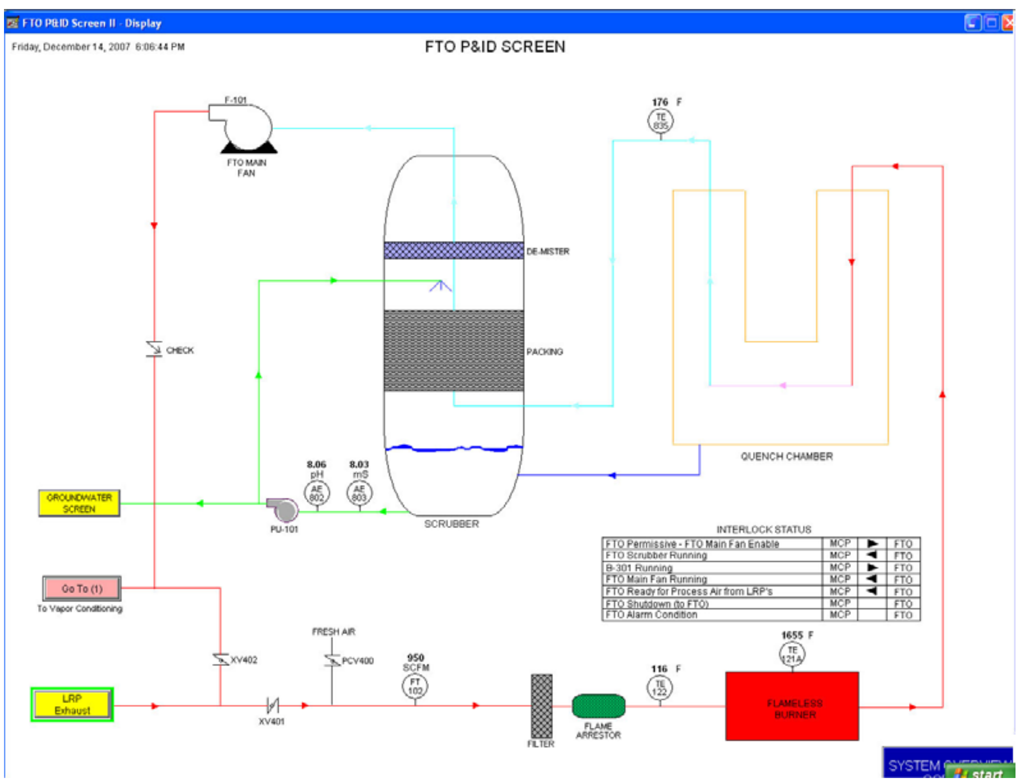
Vapor Treatment System Screen

T N & Associates, Inc.
Engineering and Science

Figure 5.1
System Main Computer Screenshots
Pemaco Superfund Site, Maywood, CA

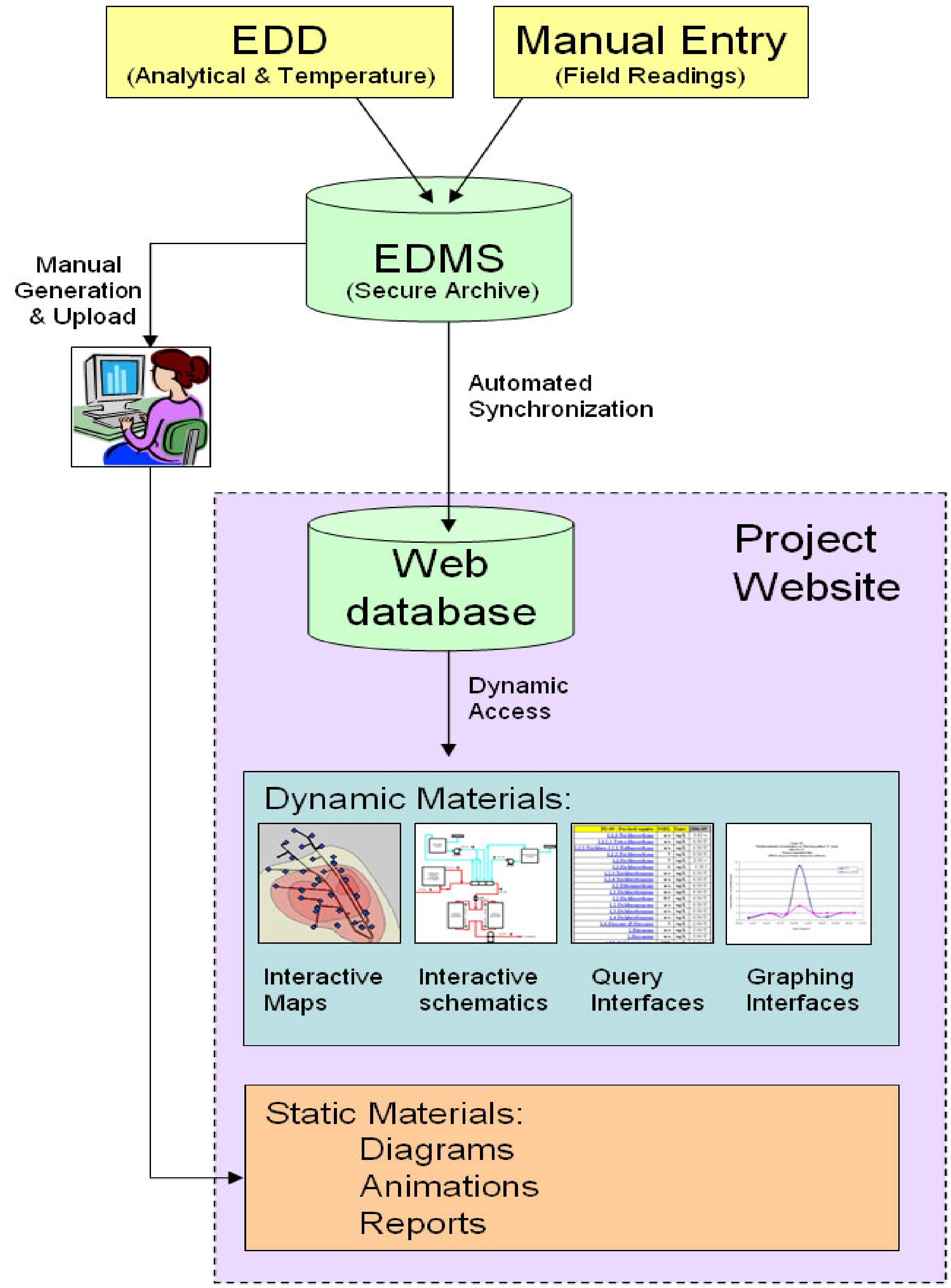


Vapor Conditioning P&ID Screen



FTO P&ID Screen

TN&A T N & Associates, Inc. Engineering and Science	**Figure 5.1** **System Main Computer Screenshots** **Pemaco Superfund Site, Maywood, CA**



T N & Associates, Inc.
Engineering and Science

Figure 7.1
Data Management Flow Diagram
Pemaco Superfund Site, Maywood, CA

TABLES

Table 2.1
Treatment System Equipment
Pemaco Superfund Site, Maywood, CA

P&ID	Item Description	Material/Schedule	Operating Specifications	"As-Built" Specified Manufacturer Catalog	Other Specifications
B-101	Liquid-Ring Vacuum Pump System	TYP	75 hp/1100 acfm	Oil-Sealed 75 hp Dekker Vacuum Technologies, Inc. System Model #VMX1103KA1-01	Equipped with oil liquid ring, system interlock/failsafe, alarms, and hour meters. Maximum vacuum 29 in. Hg. 1100 rpm. Max. noise level: 80 dBA. See Table 4-12 - Major Equipment Specifications for more details.
B-102	Liquid-Ring Vacuum Pump System	TYP	75 hp/1100 acfm	Oil-Sealed 75 hp Dekker Vacuum Technologies, Inc. System Model #VMX1103KA1-01	Equipped with oil liquid ring, system interlock/failsafe, alarms, and hour meters. Max. vac. 29 in. Hg. 1100 rpm. Max. noise level: 80 dBA. See Table 4-12 - Major Equipment Specifications for more details.
B-301	System Exhaust Blower with Sound Enclosure	TYP	1,000 cfm, 25 hp	Baldor EM4103T - 25 hp Motor, Roots Rotary Positive Blower - Frame Size 615, SDY 54-106-AA Silencer	25 hp, 1770 rpm, TEFC, 1036 cfm @ 1750 rpm, 7 psi. See Submittal 11215-16 for sound enclosure details.
CT-201	Cooling Tower, VC Package	TYP	650 gpm	AQUA-Loop Cooling Tower MB-300	To be provided as part of the vapor conditioning package. Water evaporation rate: 7.0 gpm. Water blowdown rate: 3.0 gpm. Total water consumption rate is estimated to 10.0 gpm.
CV-401, 402	Bypass Control Valves	CPVC schedule 80	Rated for 15 psig, 200^{o} F	Hayward Manual Butterfly Valve Engineer Approved Equivalent	Flanged Butterfly valve with Viton elastomer
D-601	Regenerative Desiccant Dryer	TYP	5 scfm, 90 psig, -90°F Dew Point	KAESER KADW-10	To provide continuous 5 scfm, 90 psig, and -90°F dew point purge air to FTO, Regenerative desiccant type
dPIT-101	Differential Pressure Indicating Transmitter	Stainless Steel	0-10in. wc	Dwyer Instrument Model# 605-10	Electrical accuracy ±0.5%, mechanical accuracy ±2%, 4-20 mA, 2 wire, 10-35 VDC, 0-10 in. wc stainless steel connection tubing
F-101	Inlet Vacuum Particulate Filter	Stainless Steel	5 microns/2000 acfm	Solberg CSL-485P(2)-1200FS1 485P Polyester Element	99%+ removal efficiency, Inlet air enters canister above element, SS Housing cartridge filter, Positive sealing O-ring seal system, 0.5 bar pressure for vacuum tightness, Vacuum level: 1x10 ^{3} mmHg. Two filters installed in parallel with valving as shown in Drawing M-4. Nominal Rating: 4950 scfm, two (2) 485P elements per filter housing. 6" inlet/outlet are custom welded.
F-102	Inlet Vacuum Particulate Filter	Stainless Steel	5 microns/2000 acfm	Solberg CSL-485P(2)-1200FS1 485P Polyester Element	99%+ removal efficiency, Inlet air enters canister above element, SS Housing cartridge filter, Positive sealing O-ring seal system, 0.5 bar pressure for vacuum tightness, Vacuum level: 1x10 ^{3} mmHg. Two filters installed in parallel with valving as shown in Drawing M-4. Nominal Rating: 4950 scfm, two (2) 485P elements per filter housing. 6" inlet/outlet are custom welded.
F-103	Oil Mist Exhaust Filter	Stainless Steel	0.3 microns/1100 scfm	Solberg HDL-PSG474-2-500	0-5 psig operating, 10 psig proof pressure, Minimum 99.97% D.O.P. on 0.3 micron diameter particles, Positive sealing O-ring seal system, SS Housing cartridge filter. Two filters installed in parallel with valving as shown in Drawing M-4.
F-104	Oil Mist Exhaust Filter	Stainless Steel	0.3 microns/1100 scfm	Solberg HDL-PSG474-2-500	0-5 psig operating, 10 psig proof pressure, Minimum 99.97% D.O.P. on 0.3 micron diameter particles, Positive sealing O-ring seal system, SS Housing cartridge filter. Two filters installed in parallel with valving as shown in Drawing M-4.
F-401	Water Filter, four (4) size two bag filter housings in one vessel	316 Stainless Steel	400 gpm	Hayward/Eaton Filtration, LLC. Qic-Lock^{TM} Maxiline^{TM} VMBF SE # VMBF-0402-AB10-040A-UT-11SE	Multiple 316 SS bag filter with (4) size two bag filter housings inside one vessel, spring assisted cover, 4" flanged inlet/outlets, low profile for quick filter replacement. Mounted on skid with single bag filter F-402. Inlet/outlet shut-off valves as shown in Drawing M-4.
F-402	Water Filter, one (1), size two bag filter housing	316 Stainless Steel	180 gpm	Krystil Klear Filtration L88302FB610, 100 psi	Single 316 SS bag filter with (1) size two bag filter housing, 2" flanged inlet/outlets, low profile fo quick filter replacement. Mounted on skid with multiple bag filter housing F-401. Shut-off valves as shown in Drawing M-4.
F-403	Water Filter, size two bag filter housing	316 Stainless Steel	180 gpm	Krystil Klear Filtration L88302FB610, 100 psi	Single 316 SS bag filter with size two bag filter housing, 2" flanged inlet/outlets. Skid mounted. Shut-off valves as shown in Drawing M-4.
F-404	Water Filter, size two bag filter housing	316 Stainless Steel	180 gpm	Krystil Klear Filtration L88302FB610, 100 psi	Single 316 SS bag filter with size two bag filter housing, 2" flanged inlet/outlets. Skid mounted. Shut-off valves as shown in Drawing M-4.
F-501	Water Filter, size two bag filter housing	316 Stainless Steel	180 gpm	Krystil Klear Filtration L88302FB610, 100 psi	Single 316 SS bag filter with size two bag filter housing, 2" flanged inlet/outlets. Skid mounted. Shut-off valves as shown in Drawing M-4.
F-502	Water Filter, size two bag filter housing	316 Stainless Steel	180 gpm	Krystil Klear Filtration L88302FB610, 100 psi	Single 316 SS bag filter with size two bag filter housing, 2" flanged inlet/outlets. Skid mounted. Shut-off valves as shown in Drawing M-4.
F-601	Air Filter-compressed air particulate filter with automatic drain	Aluminum	250 cfm @ 100 psig	Kaeser KPF-250	Maximum working pressure: 250 psig. Maximum operating temp: 150°F.
F-801	Calcium Filter	TYP	20 gpm min/<3ppm Calcium	U.S. Filter Duplex KF-2 21"x62" KFZSDO21FPZVCX	US Filter KF Series Duplex Alternating Softener w/ brine tank, Feed Temp 45-100°F, Feed pressure 30-100 psig, <3ppm Calcium, 77 gpm, 110V
FA-301	Flame Arrestor	Aluminum outer body with 316 SS internal	Not Specified	GROTH Model 80013075	Flame arrestor to serve as a backflash prevention device (from vapor phase carbon vessels). Aluminum outer body with 316 SS internal, 12.72" outer diameter, 55 pounds.
FE-101	Vapor Flow Element-Averaging Pitot Tube	Sensor Tube - 304 SS	0-3040 scfm	Dywer DS-300-8"	Averaging pitot tube to be used with differential pressure transmitter (dPIT-101), valve is rated a 200 psig and 200°F, 1/4" NPT connection.
FI-101 to 108	Vapor Flow Indicator	Brass	Not Specified	Swagelock Borethrough B-500-1-4BT with Plug (B-500-P)	1/4" NPT borethrough fitting for insertion of averaging pitot tube.
FQI-401	Flow Totalizer & Indicator	PVDF Rotor, PVC schedule 80 TEE	22-450 gpm	Signet Series 515 Rotor X, Signet Series 8550 ProcessPro Flow Transmitter, Signet Installation Fitting 3" Tee	Self-powered flow sensor, housing material PVDF, rotor material nat. PVDF, pipe size 1/2" to 4" <Harrington Plastics Part# PS1530-V0>, Field mount with dual input/output <Harrington Plastics Part# 3-8550-3>, 4-20mA, 24 VDC power, <Harrington Plastics Part# PV8T030>, Accuracy: +/ 0.5%.
FQI-402	Flow Totalizer & Indicator	Brass	2.5-160 gpm	McMaster-Carr 3786k96	Corrosion-Resistant totalizer with Impeller, NPT male connection. Accuracy: +/- 1.5%.
FQI-501	Flow Totalizer & Indicator	PVDF Rotor, PVC schedule 80 TEE	20-200 gpm	Signet Series 515 Rotor X, Signet Series 8550 ProcessPro Flow Transmitter, Signet Installation Fitting 2" Tee	Self-powered flow sensor, housing material PVDF, rotor material nat. PVDF, pipe size 1/2" to 4" <Harrington Plastics Part# PS1530-V0>, Field mount with dual input/output <Harrington Plastics Part# 3-8550-3>, 4-20mA, 24 VDC power, <Harrington Plastics Part# PV8T020>, Accuracy: +/ 0.5%.
FTO-101	Flameless Thermal Oxidizer and Scrubber	Not Specified	1000 scfm Max.	ANGUIL EDGE QR-1000	To be provided by Anguil and procured by USACE
H-201 A/B/C	Air Chiller/Condenser	Stainless Steel/Zinc Plated Steel	297 gpm	Xchanger Model TV-275	The VC Package must be capable of interfacing with both the FTO PLC and treatment compound PLC. 297 gpm, Design Temp: -100°F to 225°F.
H-202	Air Warmer	Stainless Sheaath and Fins	Not Specified	Vulcan VFT612-10C3 Low Temp Duct Heater	The VC Package must be capable of interfacing with both the FTO PLC and treatment compound PLC. Inlet air temperature shall not exceed 100°F.
H-401	Heat Exchanger	Stainless Steel/Copper coils	20 gpm	Xchanger, Inc. LC series or equivalent	See Table 4-12 Major Equipment Specifications for more details. Temperature in: 165°F, Temperature out: 130°F. Pressure loss: 2.1 psi. Design temperature: -300 to 200°F.
K-601	Rotary Screw Air Compressor and receiver tank	TYP	125 PSI, 124 scfm, 30 Hp, 240 gallon receiver	Kaeser Compressor AS-30	See Table 4-12 - Major Equipment Specifications for more details.
LI-101	Level Indicator	Clear PVC	Not Specified	MK Environmental Stilling Well Level Control Typical	Level indicator for moisture separator to consist of clear pipe with valves and flanges/unions to allow for replacement/cleaning of indicator
LI-201	Level Indicator	Clear PVC	Not Specified	MK Environmental Stilling Well Level Control Typical	Level indicator for moisture separator to consist of clear pipe with valves and flanges/unions to allow for replacement/cleaning of indicator
LI- 401	Level Indicator	Clear PVC	Not Specified	MK Environmental Stilling Well Level Control Typical	Level indicator for moisture separator to consist of clear pipe with valves and flanges/unions to allow for replacement/cleaning of indicator
LI-402	Level Indicator	Clear PVC	Not Specified	MK Environmental Stilling Well Level Control Typical	Level indicator for moisture separator to consist of clear pipe with valves and flanges/unions to allow for replacement/cleaning of indicator
LI-901	Level Indicator	Clear PVC	Not Specified	Poly Processing Co. Float Type Sight Gage	Level indicator for caustic tank. Mechanical gauge mounted onto the top of the double contained caustic tank.
LSH-101	Level Switch High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSH-201	Level Switch High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSH-401	Level Switch High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSH-501	Level Switch High	Stainless Steel	Not Specified	GEMS Stainless Steel Multilevel Float Switch - LS800-3-BR-SS-SPST-20-GR2-3	Plumbing and electrical configured for quick removal for cleaning/replacement, 316 SS, SS ARMCO PH-15-7MO Grip Rings, -40 to 300°F.
LSHH-101	Level Switch High-High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSHH-201	Level Switch High-High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSHH-401	Level Switch High-High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSHH-402	Level Switch High-High	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSHH-501	Level Switch High-High	Stainless Steel	Not Specified	GEMS Stainless Steel Multilevel Float Switch - LS800-3-BR-SS-SPST-20-GR2-3	Plumbing and electrical configured for quick removal for cleaning/replacement, 316 SS, SS ARMCO PH-15-7MO Grip Rings, -40 to 300°F.
LSL-101	Level Switch Low	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSL-201	Level Switch Low	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSL-401	Level Switch Low	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSL-501	Level Switch Low	Stainless Steel	Not Specified	GEMS Stainless Steel Multilevel Float Switch - LS800-3-BR-SS-SPST-20-GR2-3	Plumbing and electrical configured for quick removal for cleaning/replacement, 316 SS, SS ARMCO PH-15-7MO Grip Rings, -40 to 300°F.
LSL-901	Level Switch Low	316 Stainless Steel	Not Specified	Dwyer/W. E. Anderson Series F7-ST713 Vertical Level Switch	Vertical Level Switch installed from the top of the double contained tank. Float material must be chemically compatible with 25% NaOH solution.
LSLL-401	Level Switch Low-Low	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.
LSLL-402	Level Switch Low-Low	Stainless Steel	Not Specified	W.E. Anderson Flotec® Series L6 L6EPBBS3A	Plumbing and electrical configured for quick removal for cleaning/replacement, -4 to 220°F, Explosion proof, SPDT switch type, 1" NPT, 304 SS Cylindrical Float.

Table 2.1
Treatment System Equipment
Pemaco Superfund Site, Maywood, CA

P&ID	Item Description	Material/Schedule	Operating Specifications	"As-Built" Specified Manufacturer Catalog	Other Specifications
P-201	Cooling Tower Transfer Pump	Stainless Steel	Not Specified	SCOT ARDOX Motorpump - 1750 rpm, 20 hp, 9.38" Impeller, TEFC	To be provided as part of the vapor conditioning package.
P-202	Refrigerated Chiller Pump	Stainless Steel	Not Specified	ITT Goulds Pump - 2ST1H5B4, 3 hp, TEFC Motor	To be provided as part of the vapor conditioning package.
P-203	VC Package Condensate Pump	Polypropylene, ETFE	52 gpm/45' TDH	Pacer Pumps - Z-40, 1/2 hp	To be provided as part of the vapor conditioning package
P-401	Booster Tank Pump	316 Stainless Steel	110 gpm/55' TDH/3 Phase, 460 V	ITT Goulds Pump - 2ST1H2B4, 3 hp, ODP Motor	Centrifugal pump see Major Equipment Specifications for more details. The pump may pass no more than 3/16" particle.
P-402	Holding Tank Pump	316 Stainless Steel	100 gpm/75' TDH/3 Phase, 460 V	ITT Goulds Pump - 2ST1JSA4, 5 hp, ODP Motor	Centrifugal pump see Major Equipment Specifications for more details. The pump may pass no more than 3/16" particle.
P-501	Transfer Pump	316 Stainless Steel	30 gpm/75' TDH/3 Phase, 460 V	AMT Self-Priming Centrifugal Pump 282B-98	Self priming centrifugal see Major Equipment Specifications for more details. The pump can handle 3/8" diameter semi-solids.
P-502	Pump for Secondary Containment Sump	316 Stainless Steel	30 gpm/35' water/3 Phase, 460 V	Dayton Submersible Sewage Pump DN2110070T	Submersible sump pump, solid handeling, self priming. Equipped with LSL, LSH, LSHH, system interlock, and alarms.
P-901	Metering Pump	TYP	34 gph @ 1725 rpm	MacRoy Pump D7688PE1NIN	Provided by Anguil and installed by the contractor.
PI-101 to 103, 201 to 203, 414	Air Pressure Indicator	304 SS Case/316 SS Internal	0-15 PSI	McDaniel Controls K9A-GF (0-15 psi)	2-1/2" Dial Glycerin-Filled, Grade 1A, 1/4" Bottom NPT male connection
PI-401 to 405, 407, 408, 501, 502	Water Pressure Indicator	304 SS Case/316 SS Internal	0-60 PSI	McDaniel Controls K9C-GF (0-60 psi)	2-1/2" Dial Glycerin-Filled, Grade 1A, 1/4" Bottom NPT male connection
PI-406, 409 to 413, 415, 503, 504	Water Pressure Indicator	304 SS Case/316 SS Internal	0-30 PSI	McDaniel Controls K9B-GF (0-30 psi)	2-1/2" Dial Glycerin-Filled, Grade 1A, 1/4" Bottom NPT male connection
PI-601	Air Pressure Indicator	316 Stainless Steel	0-200	Kodiak Controls Glyrcerine Filled, 2-1/2-in Dial Size, SS316, Model KC301L Pressure Indicating Gauge (0-200 psi)	2-1/2" Dial Glycerin-Filled, 1.5% Accurancy, 1/4" Bottom NPT male connection
PI-602	Air Pressure Indicator	304 SS Case/316 SS Internal	0-160	McDaniel Controls K9E-GF (0-160 psi)	2-1/2" Dial Glycerin-Filled, Grade 1A, 1/4" Bottom NPT male connection
PRV-401, 402, 403, 404, 901, 902	Pressure Relief Valve	Not Specified	Not Specified	Poly Processing Co. 2" Mushroom (PPL) Relief Valve with Viton Seals	T-401 has (3) 2" vents. T-402 has (2) 2" vents. T-901 has (3) 2" vents.
PRV-405	Pressure Relief Valve	Not Specified	Not Specified	McMaster-Carr #4780K16, 2", set at 65 psi	PRV-406 is not necessary as PRV-405 will be mounted on the inlet manifold to T-403 and T-40 and will serve both tanks adequate pressure and flow should be maintained down stream of valve.
PRV-101, 301, 303	Pressure Relief Valve	Not Specified	Not Specified	Kunkle Model 337 #0337-H01ANE0005	2", set point 6 psig.
PRV-602	Pressure Relief Valve	Not Specified	Not Specified	Control Devices, Inc. SF50	Set point 140 psi, capacity 257 scfm
PS-601	Pressure Switch	Stainless Steel	22.5-125 PSI	McMaster# 46995K18, 22.5-125 psi, Nema 4	Compact cylindrical pressure switch, Nema 4, 1/2" NPT male, 5A @ 125/250 VAC, Buna - N diaphragm - sealed piston, set point range 22.5-125 psi, SPDT
PT-101	Air Pressure Transmitter	Stainless Steel	0-5 PSI	Dwyer Instrument Model# 673-3C, 0-5 psi	±0.25% full span accuracy, 17-4 PH SS, 4 to 212°F, 4-20 mA, 2 wire, 0-15 psi
PT-401	Water Pressure Transmitter	316 Stainless Steel	0-60 PSI	McMaster# 3196K1, 0-60 psi	Economy transducer, 1/4" NPT male, 316 SS, -40 to 212°F,≤ 0.5% accuracy, 10-30 VDC, 2 wire, 4-20 mA
PT-402	Water Pressure Transmitter	Stainless Steel	0-5 PSI	Dwyer Instrument Model# 673-3C, 0-5 psi	±0.25% full span accuracy, 17-4 PH SS, 4 to 212°F, 4-20 mA, 2 wire, 0-5 psi
PT-403	Water Pressure Transmitter	316 Stainless Steel	0-60 PSI	McMaster# 3196K1, 0-60 psi	Economy transducer, 1/4" NPT male, 316 SS, -40 to 212°F,≤ 0.5% accuracy, 10-30 VDC, 2 wire, 4-20 mA
PT-404	Water Pressure Transmitter	316 Stainless Steel	0-60 PSI	McMaster# 3196K1, 0-60 psi	Economy transducer, 1/4" NPT male, 316 SS, -40 to 212°F,≤ 0.5% accuracy, 10-30 VDC, 2 wire, 4-20 mA
PT-501	Water Pressure Transmitter	316 Stainless Steel	0-60 PSI	McMaster# 3196K1, 0-60 psi	Economy transducer, 1/4" NPT male, 316 SS, -40 to 212°F,≤ 0.5% accuracy, 10-30 VDC, 2 wire, 4-20 mA
R-601	Air Regulator	TYP	5-125 psi	McMaster# 4959K57	1 1/2" NPTF, Maximum scfm @ 100 psi: 440 scfm
R-602	Air Regulator	TYP	10-250 psi	McMaster# 4959K54	3/4" NPTF, Maximum scfm @ 100 psi: 220 scfm
R-603	Air Regulator	TYP	5-125 psi	McMaster# 4959K55	1" NPTF, Maximum scfm @ 100 psi: 480 scfm
R-604	Air Regulator	TYP	5-125 psi	McMaster# 4959K55	1" NPTF, Maximum scfm @ 100 psi: 480 scfm
R-605	Air Regulator	TYP	5-125 psi	McMaster# 4959K55	1" NPTF, Maximum scfm @ 100 psi: 480 scfm
R-606	Air Regulator	TYP	5-50 psi	McMaster# 4959K55	1" NPTF, Maximum scfm @ 100 psi: 480 scfm
RC-201	Refrigerated Chiller, VC Package	Copper Tube/Aluminum Fin	25 Ton/300,000 Btu/h	Zarsky Water Chillers - Model: ACWC-300-E	The VC Package must be capable of interfacing with both the FTO PLC and treatment compound PLC. Carrier Semi-Hermetic Compressor, 460V, 3 Phase
T-101	Moisture Separator	1/4" minimum hot rolled steel	Remove 95% of all liquid droplet/30 in. Hg Max. Vacuum	tetraSOLV Filtration, 500 gallon., 316 SS, 30" Hg Vacuum. (Skid: 60"Wx60"Lx4"H)	See Table 4-12 - Major Equipment Specifications for more details. 10 microns droplet size @ 99% removal efficiency.
T-201	Moisture Separator	cross linked HDPE	60 gallon	Poly Processing - 60 gallon Upright Tank	The VC Package must be capable of interfacing with both the FTO PLC and treatment compound PLC.
T-202	Cooling Water Tank, VC Package	cross linked HDPE	280 gallon	Poly Processing - 280 gallon Upright Tank	The VC Package must be capable of interfacing with both the FTO PLC and treatment compound PLC.
T-301 & 302	Vapor-Phase Carbon Vessel	Double layered Epoxy Coated Carbon Steel, Vacuum Rated	4,000 lb, 3000 cfm, 15 psig, 4 in. Hg vacuum.	tetraSOLV Filtration VFV-5000, 5000 pounds	Operating fill: 4,000 lb virgin coconut shell carbon. See Table 4-12 - Major Equipment Specifications for more details.
T-401	Groundwater Booster Tank	cross linked HDPE	905 gallon	Poly Processing Company Stock Number 41100905	Vapor tight, bolted, polyethylene man way with viton gaskets with 19" opening. Sight tube/level indicator with unions and isolation valves for quick disassembly/replacement and clean-out.
T-402	Water Holding Tank	cross linked HDPE	4,900 gallon	Poly Processing Company Stock Number 11004900.	Vapor tight, bolted, polyethylene man way with viton gaskets with 19" opening. Sight tube/level indicator with unions and isolation valves for quick disassembly/replacement and clean-out.
T-403 & 404	Liquid-Phase Carbon Adsorber	Double layered Epoxy Coated Carbon Steel	3,000 pound/150 gpm/75 psig	tetraSOLV Filtration, hpAF-3000, 3000 lbs	Operating fill: 3,000 pound virgin coconut shell carbon. See Table 4-12 - Major Equipment Specifications for more details.
T-601	Air Receiver Tank	Painted Carbon Steel	240 gallon	Manchester Tank - Vertical Air Receiver, 240 gallon	Maximum working pressure: 200 psi @ 400°F. Include a pressure gauge, pressure relief valve, automatic drain, manual drain, and galvanized steel plumbing.
T-602	Air Receiver Tank Condensate Drum	Epoxy Coated Steel	55-gallon Drum/200 pound capacity	SKOLNIK - 55 gallon. TH Drum, 2 Hoops	Not Specified
T-701	Holding Tank Carbon Vessel (vent)	Internal: Polyamide Epoxy Resin/External: Urethane Enamel	55 gallon	tetraSOLV - VFD-55	55-gallon carbon drum filled with virgin coconut shell carbon.
T-901	Caustic Soda Tank	Crosslinked Polyethylene Double-wall	1,500 gallon	Poly Processing Company SAFE-TANK® Stock Number 42001550	See Table 4-12 - Major Equipment Specifications for more details.
TI-101 to 108, TI-201 to 207	Temperature Indicator	Stainless Steel	30-240°F	Taylor Bitherm Dial Thermometer BB3102E083	3" Dial Bimetal Stem Thermometer, 30 to 240°F, 316 SS, Back or Bottom NPT male connectio with thermowell
TIT-101, 102, 201, 202, 301, 401, 402, 501	Temperature Indicating Transmitter	Stainless Steel	0-200°F	Siemens SITRANS TF2 7NG3140-3BK00	Temperature Transmitter with Display and RTD sensor, straight thermowell, 1/2" NPT, 4" bore depth, 316 SS
V-101 to 108	Vapor Diaphragm Valves	316 SS Trim	250 psi	NIMCO 250 PSI Gear-Actuated Butterfly Valve, Wafer Style, Memory Stop	Wafer style, Fluoroelastomer seal, 316 SS Trim, Geometric drive, Extended neck, Molded-in seat liner, Gear operator: memory stop.
V-407	Actuated Valve	PVC SCH 80	150 psig	OSCAF #5213-09-0400 mounted with ETI 1300 Electric Actuator	Controlled by PLC
V-452	3-Way True Union Ball Valve with Electric Actuator	CPVC schedule 80	Rated for 15 psig, 200° F	Spears True Union 2000 Industrial 3 Way Ball Valve with Viton seals and L port Spears Premium Electric TU Ball Valve	Controlled by PLC.
V-606	Compressed air FTO instrumentation solenoid control valve	Brass	150 psig	N/A	Solenoid valve V-606 is believed to be redundant with *Anguil provided* SV-604 (shown on Anguil Dwg 12584-101 Rev. C). It was agreed on 1/8/07 between D.C and J.W. that ERM will not install. R.M. copied via email
V-607	Compressed air supply 3-way solenoid valve	Brass	150 psig	ASCO 1" Air and Water Solenoid Valve 8316G34	Controlled by PLC, normally closed, 150psi (AC)/125 psi (DC)
VI-101 to 111, 201, 301 to 306	Vacuum Indicator	Stainless Steel	0 to -30" Hg	McDaniel Controls K9S-GF (30"-0in. Hg)	2-1/2" Dial Glycerin-Filled, Grade A, Back or Bottom connection, 5" Figure Interval, 0.5" Grad. Mark, 1/2" NPT male, 316 SS
VT-101, 201	Pressure Transmitter	Stainless Steel	0 to -30" Hg	McMaster# 3200K1, -30 in. Hg-0 psi	High accuracy transducer, 1/2" male NPT, 316 SS, -40 to 212°F, < 0.25% accuracy, 10-30 VDC, 2 wire, 4-20 mA

Notes:

AC - alternating current
CPVC - chlorinated polyvinyl chloride
DC - direct current
ETFE - ethylene tetrafluoroethylene
FTO - flameless thermal oxidizer
NPT - national pipe thread
NPTF - national pipe thread, female
P&ID - piping and instrumentation diagram
PLC - programmable logic controller

PVC - polyvinyl chloride
PVDF - polyvinylidene fluoride
SPDT - single pole, double throw
SS - stainless steel
TDH - total dynamic head
TEFC - totally enclosed, fan-cooled
TYP - typical
VC - vapor conditioning

acfm - actual cubic feet per minute
Btu/h - British thermal units per hour
cfm - cubic feet per minute
dBA - A-weighted decibels
gph - gallons per hour
gpm - gallons per minute
hp - horsepower
in. Hg - inches of mercury
in. wc - inches of water column

mmHg - millimeters of mercury
°F - degree Fahrenheit
ppm - part per million
psi - pounds per square inch
psig - pounds per square inch gauge
rpm - revolutions per minute
scfm - standard cubic feet per minute
V - volt

Table 2.2
Extraction Well Specifications
Pemaco Superfund Site, Maywood, CA

Well ID	Associated Hydrogeologic Unit	Casing Diameter (inches)	Screen Material	Well Casing Material	Screen Interval (feet bgs)	Screen Slot Size (inches)	Screen Length (feet)	Filter Pack Sand Size	Total Depth of Well (feet bgs)
PA-1	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	17 - 27	0.020	10	2/12	30
PA-2	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22 - 32	0.020	10	2/12	35
PA-3	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22 - 32	0.020	10	2/12	35
PA-4	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	20 - 30	0.020	10	2/12	30
PA-5	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	20 - 30	0.020	10	2/12	30
PB-1	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	26 - 36	0.020	10	2/12	40
PB-2	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22 - 32	0.020	10	2/12	35
PB-3	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22 - 32	0.020	10	2/12	35
PB-4	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	16 - 26	0.020	10	2/12	30
PB-5	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	24 - 34	0.020	10	2/12	35
PB-6	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	22 - 32	0.020	10	2/12	35
PB-7	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	24 - 34	0.020	10	2/12	35
PC-1	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	15 - 25	0.020	10	2/12	25
PC-2	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	17 - 27	0.020	10	2/12	30
PC-5	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	29 - 39	0.020	10	2/12	40
PC-6	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	28 - 38	0.020	10	2/12	40
PD-1	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	17 - 27	0.020	10	2/12	30
PD-4	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	27 - 37	0.020	10	2/12	40
PD-5	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	27 - 37	0.020	10	2/12	40
PD-6	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	24 - 34	0.020	10	2/12	35
PD-7	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	26 - 36	0.020	10	2/12	40
PD-8	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	26 - 36	0.020	10	2/12	37
PD-9	Perched Zone	4	Schedule 40 PVC	Schedule 40 PVC	28 - 38	0.020	10	2/12	40
DA-1	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	61 - 76	0.020	15	2/12	77
DA-2	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	72 - 82	0.020	10	2/12	83
DA-3	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	74 - 84	0.020	10	2/12	85
DA-4	A Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	56 - 66	0.020	10	2/12	67
DA-5	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	68 - 78	0.020	10	2/12	80
DA-6	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	60-70	0.020	10	2/12	71
DA-7	A Zone	6	**316 Stainless Steel**	Schedule 80 PVC	61 - 71	0.020	10	2/12	72
DA-8	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	65 - 75	0.020	10	2/12	76
DA-9	A Zone	6	**316 Stainless Steel**	Schedule 80 PVC	66 - 76	0.020	10	2/12	77
DA-10	A Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	66 - 76	0.020	10	2/12	77
DA-11	A Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	64 - 74	0.020	10	2/12	76
DA-12	A Zone	6	Schedule 40 PVC	Schedule 40 PVC	66 - 76	0.020	10	2/12	77
DAB-1	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	70 - 90	0.020	20	2/12	91
DAB-2	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	70 - 90	0.020	20	2/12	91
DAB-3	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	68.5 - 88.5	0.020	20	2/12	89.5
DAB-4	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	66 - 86	0.020	20	2/12	87
DAB-5	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	69 - 89	0.020	20	2/12	90
DAB-6	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	67 - 87	0.020	20	2/12	88
DAB-7	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	68 - 88	0.020	20	2/12	89
DAB-8	A & B Zone	6	Schedule 80 PVC	Schedule 80 PVC	65 - 85	0.020	20	2/12	86
DB-1	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	83 - 93	0.020	10	2/12	94
DB-2	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	86 - 96	0.020	10	2/12	97
DB-3	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	77 - 87	0.020	10	2/12	88
DB-4	B Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	75 - 85	0.020	10	2/12	86
DB-5	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	80 - 90	0.020	10	2/12	90
DB-6	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	80 - 90	0.020	10	2/12	91
DB-7	B Zone	6	**316 Stainless Steel**	Schedule 80 PVC	81 - 91	0.020	10	2/12	92
DB-8	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	81 - 91	0.020	10	2/12	92
DB-9	B Zone	6	**316 Stainless Steel**	Schedule 80 PVC	84 - 94	0.020	10	2/12	94
DB-10	B Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	81 - 91	0.020	10	2/12	92
DB-11	B Zone	6	**316 Stainless Steel**	**Low Carbon Steel**	76 - 86	0.020	10	2/12	87
DB-12	B Zone	6	Schedule 80 PVC	Schedule 80 PVC	83.5 - 93.5	0.020	10	2/12	94.5

Table 2.2
Extraction Well Specifications
Pemaco Superfund Site, Maywood, CA

Well ID	Associated Hydrogeologic Unit	Casing Diameter (inches)	Screen Material	Well Casing Material	Screen Interval (feet bgs)	Screen Slot Size (inches)	Screen Length (feet)	Filter Pack Sand Size	Total Depth of Well (feet bgs)
VR-01LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	37 - 47	0.020	10	2/12	47.6
VR-02LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	39 - 49	0.020	10	2/12	49.7
VR-02P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	20	2/12	34.5
VR-03LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-04LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	39 - 49	0.020	10	2/12	49.9
VR-04P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	23 - 33	0.020	10	2/12	33.5
VR-05LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-05P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	25 - 35	0.020	10	2/12	35.3
VR-06LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	39 - 49	0.020	10	2/12	49.8
VR-07LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.6
VR-07P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.6
VR-08LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-09LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.4
VR-10LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.0
VR-10P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.6
VR-11LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-11P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.9
VR-12LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.0
VR-12P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.7
VR-13LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-14LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.0
VR-15LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.2
VR-16LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.5
VR-17LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	39 - 49	0.020	10	2/12	49.9
VR-17P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.8
VR-18LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.0
VR-18P	Perched Zone	2	Schedule 80 CPVC	Schedule 80 CPVC	24 - 34	0.020	10	2/12	34.8
VR-19LV	Lower Vadose	2	Schedule 80 CPVC	Schedule 80 CPVC	40 - 50	0.020	10	2/12	50.0

Notes:
CPVC - chlorinated polyvinyl chloride
PVC - polyvinyl chloride
VR - vapor recovery
feet bgs - feet below ground surface

Table 3.1
Field Form Summary
Pemaco Superfund Site, Maywood, CA

Form Number	Form Title	Description	Collection Frequency
1	Manifold / LEL Instrument Measurement	Includes daily manifold status (differential pressure, temperature, and vacuum), PID readings, and MultiRAE Plus PGM-50 readings (VOC, LEL, H_2S, CO, and oxygen)	Daily and Weekly
2	Field Input Form for Process Physical Parameters Gauges and Sampling Ports	Contains primary gauge readings collected in the treatment plant, including vacuum, pressure, and temperature	Daily and Weekly
3	Field Input Form for Process Physical Parameters from PLC and Manual	Includes utility meter readings, flow totalizer readings, and major operating parameters in the SCADA computer, including pressure, vacuum flow, and temperature	Daily
4	Daily Vapor Sampling	SP-102 daily vapor influent sampling record	Daily
5	Weekly Vapor Sampling	Weekly vapor sampling record, including sample port SP-102, 104, 106, 108 through 117, 801 through 805, and SP-900 (trip blank)	Weekly
6	Weekly Process Water Sampling	Weekly process water sampling record, including sample port SP-201, 204, 206, 208, 210, and 212~215	Weekly
7	Field Input Form for VR Wells	Contains ERH VR Well field data such as PID readings, temperature, vacuum, and valve status	Weekly during ERH
8	Field Input Form for Electrode Wells	Contains ERH Electrode Well field data such as PID readings, temperature, vacuum, and valve status	Weekly
9	Field Input Form for Temperature Thermocouple 10% Validation	ERH Temperature Thermocouple validation readings collected at depth	2 TMPs once a week
10	Field Input Form for VMPs	ERH VMP field data record Data includes vacuum, PID/Draeger readings, and sampling method	Monthly during ERH
11	Groundwater Monitoring within ERH Area	ERH groundwater sampling	Biweekly during ERH
12	Well Valve Operations - Perched Wells	Contains perched well operation parameters collected in the field, including valve positions, water levesl, vacuums, PID readings, temperatures, and air/water flows	Weekly
13A	Well Valve Operations - Exposition Wells - Operation and Maintenance	Shows Exposition Wells valve positions	Weekly
13B	Well Valve Operations - Exposition Wells - Physical Measurements	Includes Exposition Wells physical measurements collected in the field, including water level, water temperature, vacuum, and pump pulse count	Weekly
14	Field Input Form for Sentry Soil Vapor (SSV) Probes	Includes SSV probe PID readings collected in the field. A subset of SSVs are currently being sampled but all were sampled during the baseline event and are sampled as needed.	Weekly and Monthly

Notes:
CO - carbon monoxide
ERH - electrical resistance heating
H_2S - hydrogen sulfide
LEL - lower explosive limit
PID - photoionization detector
PLC - programmable logic controller
SCADA - supervisory control and data acquisition
SSV - sentry soil vapor
TMP - temperature monitoring probe
VMP - vapor monitoring probe
VOC - volatile organic compound
VR - vapor recovery

Table 3.2
Vapor Extraction Well Field Sampling Data
Pemaco Superfund Site, Maywood, CA

Well ID	Total Depth (feet bgs)	Average Vacuum[1] (in. Hg)	Average PID[1] (ppm)	Average Temperature[1] (°F)
PA-01	30	14.3	0.2	76.3
PA-02*	35	13.6	2.4	70.1
PA-03	35	13.4	480.4	78.1
PA-04	30	12.9	56.4	73.6
PA-05	30	12.5	976.5	78.6
PB-01	40	7.5	104.5	75.3
PB-02	35	7.6	0.8	79.7
PB-03	35	11.0	0.4	74.7
PB-04	30	6.3	2.5	73.5
PB-05	35	4.1	0.6	74.2
PB-06*	35	5.3	0.0	73.6
PB-07	35	7.4	0.9	77.9
PC-01	25	10.1	0.6	71.7
PC-02	30	13.4	0.4	77.7
PC-05	40	6.6	0.9	74.1
PC-06	40	7.2	0.0	72.4
PD-01	30	11.5	19.5	76.1
PD-04	40	5.7	35.4	68.9
PD-05	40	5.5	8.2	75.8
PD-06	35	7.6	1.3	76.8
PD-07	40	9.5	1.2	71.4
PD-08	37	4.5	4.3	76.1
PD-09	40	9.1	0.3	73.1
DA-01	77	0.6	NC	77.6
DA-02	83	0.4	NC	82.3
DA-03	85	0.4	NC	81.7
DA-04 **	67	0.0	NC	72.8
DA-05	80	1.3	NC	68.1
DA-06	71	1.5	NC	82.2
DA-07	72	1.2	NC	72.8
DA-08	76	1.4	NC	80.0
DA-09	77	0.8	NC	76.0
DA-10 **	77	2.0	NC	79.6
DA-11 **	76	2.3	NC	72.5
DA-12	77	2.5	NC	83.2
DAB-01	91	1.2	NC	78.1
DAB-02	91	1.0	NC	85.1
DAB-03	89.5	1.3	NC	80.5
DAB-04	87	1.2	NC	82.5
DAB-05	90	1.2	NC	80.7
DAB-06	88	1.5	NC	77.3
DAB-07	89	1.2	NC	78.9
DAB-08	86	1.6	NC	78.5
DB-01	94	0.5	NC	76.3
DB-02	97	1.4	NC	80.0

Table 3.2
Vapor Extraction Well Field Sampling Data
Pemaco Superfund Site, Maywood, CA

Well ID	Total Depth (feet bgs)	Average Vacuum (in. Hg)	Average PID (ppm)	Average Temperature (^oF)
DB-03	88	0.9	NC	81.3
**DB-04 ** **	86	1.8	NC	73.0
DB-05	90	2.0	NC	78.3
DB-06	91	2.4	NC	81.1
DB-07	92	1.2	NC	75.4
DB-08	92	2.2	NC	81.2
DB-09	94	0.9	NC	75.8
**DB-10 ** **	92	1.4	NC	86.3
**DB-11 ** **	87	1.3	NC	80.7
DB-12	94.5	1.4	NC	79.6
VR-01LV	47.6	14.1	2.6	91.1
VR-02LV	49.7	13.6	10.8	107.1
VR-02P	34.5	13.4	3.9	102.1
VR-03LV	50.5	13.4	13.1	109.1
VR-04LV	49.9	12.7	406.2	105.1
VR-04P	33.5	11.6	15.6	101.8
VR-05LV	50.5	13.1	92.1	113.7
VR-05P	35.3	23.8	45.9	108.4
VR-06LV	49.8	13.5	88.1	126.3
VR-07LV	50.6	13.4	113.1	120.3
VR-07P	34.6	13.2	3.7	108.4
VR-08LV	50.5	12.8	227.7	95.3
VR-09LV	50.4	13.4	312.7	115.2
VR-10LV	50.0	13.4	72.7	111.6
VR-10P	34.6	13.2	15.7	80.7
VR-11LV	50.5	13.1	59.8	111.5
VR-11P	34.9	12.5	2.1	97.8
VR-12LV	50.0	13.6	81.3	89.5
VR-12P	34.7	13.1	3.8	162.5
VR-13LV	50.5	14.2	171.8	99.7
VR-14LV	50.0	14.1	12.4	87.7
VR-15LV	50.2	14.3	31.7	91.5
VR-16LV	50.5	13.5	10.7	116.1
VR-17LV	49.9	13.8	4.9	83.3
VR-17P	34.8	13.6	2.1	88.6
VR-18LV	50.0	14.0	3.6	86.0
VR-18P	34.8	13.8	1.6	78.5
VR-19LV	50.0	59.0	6.1	94.3

Notes:

1 - Averages were calculated using all field data that was collected in 2007 when well was operational.
Temperature data were collected with an infrared gun and are considered to be biased high for all vaulted wells (all perched and exposition wells).

* - Remote vault

** - Well located in the ERH area

LV - lower vadose; P - perched zone; VR - vapor recovery

^oF - degree Fahrenheit; in. Hg - inches of mercury; ppm - part per million by volume

NC - not collected since vapors were not extracted from these wells for most of 2007 with exception of DA-4, DA-5, DA-10, and DA-11

feet bgs - feet below ground surface

Table 3.3
Vapor Extraction Manifold Sampling Data
Pemaco Superfund Site, Maywood, CA

Manifold[1]	Average Vacuum (in. Hg)	Average Differential Pressure (in. wc)	Average Concentrations[2] CO (%)	H_2S (ppm)	LEL (%)	O_2 (%)	PID [5] (ppm)	Average Temperature (°F)	Average Flow Rate[4] (scfm)
DPE-A	16.2	0.1	1.1	0.0	14.8	19.4	758.3	74.4	107.8
DPE-B	16.4	0.1	0.8	0.0	4.5	20.1	34.8	69.6	107.5
DPE-C	16.8	0.1	1.0	0.0	3.3	20.1	16.4	72.9	105.6
DPE-D	16.3	0.1	0.7	0.0	16.5	18.5	55.1	70.0	107.9
VE-1 [3]	NC	NC	NC	NC	NC	NC	NC	NC	NC
VE-2	16.4	0.07	NC	NC	NC	NC	NC	69.5	90.0
VE-3	16.9	0.9	11.9	0.1	10.6	18.7	466.4	75.6	314.8
VE-4	16.0	0.07	69.0	13.0	44.0	19.0	2582.0	95.0	89.2
TRS Condenser	16.7	1.2	NC	NC	NC	NC	NC	77.2	365.7

Notes:
1 - Vapor Manifold Summary:
DPE-A: 5 wells (PA-1 through PA-5)
DPE-B: 7 wells (PB-1 through PB-7)
DPE-C: 4 wells (PC-1, PC-4 through PC-6)
DPE-D: 7 wells (PD-1, PD-4 through PD-9)
VE-1: 7 wells (DAB-1 through DAB-7)
VE-2: 15 wells (DAB-8, DA/DB-1 through DA/DB-7)
VE-3: 6 Pemaco deep wells (DA/DB-8 through DA/DB-10) and ERH Wells
VE-4: 4 Pemaco deep wells (DA/DB-11 through DA/DB-12) and ERH Wells
2 - Averages were calculated using all field data that was collected in 2007 when the manifold was operational with the exception of the flow rate for VE-2 and VE-4, which includes only data from January 2008.
3 - VE-1 was not operated because: 1) flow capacity needed for perched zone wells and ERH area and 2) would not facilitate mass removal since the wells on VE-1 are farthest downgradient
4 - Average flow rate was calculated using data collected via pitot tube method. Due to varying field and plant operational conditions, accuracy is estimated to be +/- 30%. The flow reported for VE-2 and VE-4 is representative of only 4 wells: DA-4 and DA-5 for VE-2; and DA-10 and DA-11 for VE-4.
5 - PID was calibrated for 100 ppm Isobutylene gas before each measurement.

CO - carbon monoxide
ERH - electrical resistance heating
H2S - hydrogen sulfide
LEL - lower explosive limit
NC - not collected
O2 - oxygen
PID - photoionization detector
TRS - Thermal Remediation Systems

°F - degree Fahrenheit
in. Hg - inches of mercury
in. wc - inches of water column
ppm - part per million by volume
scfm - standard cubic feet per minute

Table 3.4
Vapor Sampling Ports
Pemaco Superfund Site, Maywood, CA

Station ID	Monitoring Location	Analyte or Parameter	Laboratory[2]	Frequency	Sample Type	Purpose of Data Collection; Data Use
SP-102	Pre-FTO	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Daily	Grab	Pre-treatment concentrations to determine VOC mass removal rates
		Light hydrocarbons by TO-3(M)	Calscience	Weekly	Grab	
SP-104	Post FTO, pre-GAC; Post-Chiller	VOCs by TO-15	EPA Region 9 Lab	Weekly	Grab	To evaluate VOC mass removal rates for analytes not included on TO-15SIM list
		VOCs by TO-15SIM	Air Toxics	Weekly	Grab	To confirm calculated VOC mass removal rates; monitor system efficiency, determine when FTO is no longer needed in treatment chain
SP-104a	Post FTO, pre-GAC; Post-Chiller	VOCs by TO-15SIM	Air Toxics	As needed	1-hour Composite	To confirm calculated VOC mass removal rates; monitor system efficiency, determine when FTO is no longer needed in treatment chain
		Dioxin/Furans by CARB 428	Vista	As needed	1-hour Composite	Monitor for possible FTO-related emissions of dioxins, furans
SP-106	Post-Primary GAC Vessel	VOCs by TO-15	EPA Region 9 Lab	Weekly	Grab	To evaluate GAC efficiency
SP-108	Post-Secondary GAC Vessel	VOCs by TO-15	EPA Region 9 Lab	Weekly	Grab	
SP-109	FTO/GAC outlet - final effluent	VOCs by TO-15	EPA Region 9 Lab	Weekly	Grab	To evaluate VOC mass removal rates for analytes not included on TO-15SIM list
		VOCs by TO-15SIM	Air Toxics	Weekly	Grab	To confirm calculated VOC mass removal rates; monitor system efficiency
SP-109a	FTO/GAC outlet - final effluent	VOCs by TO-15SIM	Air Toxics	As needed	1-hour Composite	To confirm calculated VOC mass removal rates; monitor system efficiency
		Dioxin/Furans by CARB 428	Vista	As needed	1-hour Composite	Monitor for possible FTO/GAC-related emissions of dioxins, furans
SP-110	West Trench Wells* DAB-8, DA/DB-1 to DA/DB-7 (15 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-111	Wells* PA-1 to PA-5 (5 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-112	Wells* PB-1 to PB-7 (7 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-113	Wells* PD-1, PD-4 to PD-9 (7 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-114	Wells* PC-1, PC-4 to PC-6 (4 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-115	ERH East Trench Wells*; DA/DB-7 to DA/DB-10 (6 wells); 58 electrodes & 19 VRs	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-116	ERH East Trench Wells*; DA/DB-11 to DA/DB-12 (4 wells); 58 electrodes & 19 VRs**	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-117	South Trench Wells* DAB-1 to DAB-7 (7 wells)	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	Evaluate well field performance; monitor system operational efficiency
SP-801 through SP-805	Five (5) sectors of 28 VR wells, 58 electrode wells, and 21 VMPs within ERH area**	TCE, 2 - 6 highest VOCs by TO-15[1]	EPA Region 9 Lab	Weekly	Grab	ERH sector performance/efficacy; heating optimization among sectors

Notes:
1 - 2-6 highest VOC levels to be within the calibration range; reporting will include % of the highest peaks in the sample based on the chromatogram.
2 - Air Toxics - Air Toxics Ltd. Is located in Folsom, CA.
Calscience - Calscience Environmental Laboratories, Inc. is located in Garden Grove, CA.
EPA Region 9 Lab - the EPA Region 9 Laboratory is located in Richmond, CA.
Vista - Vista Analytical Laboratory is located in El Dorado Hills, CA.
* See Figure 1.2 for well locations; ** See Figure 1.3 for well locations.

CARB - California Air Resources Board
DPE - dual-phase extraction
EPA - United States Environmental Protection Agency
ERH - electrical resistance heating
FTO- flameless thermal oxidizer
GAC - granual activated carbon
SIM - selective ion mode
SP - sample port
TCE - trichloroethene
VMP - vapor monitoring probe
VOCs - volatile organic compounds
VR - vapor recovery

Table 3.5
VOC Analytical Results for the Vapor Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Description	Station ID	Date	Units (Analyte:)	1,1-Dichloroethane	1,1-Dichloroethene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	*m,p*-Xylene	n-Hexane	*o*-Xylene	Propylene	Styrene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane
VE-1 Manifold	**SP-117**	5/31/2007	ppbv	3 U	3 U	3 U	--	**870**	3 U	**9**	**8**	3 U	**6 J**	--	3 U	7 U	**14**	3 U	**6 J**	3 U	3 U	**16,000**	**8**	3 U	**230**	3 U
VE-2 Manifold	**SP-110**	5/31/2007	ppbv	17 U	17 U	17 U	--	**980**	17 U	17 U	17 U	17 U	17 U	--	17 U	33 U	**47**	17 U	17 U	17 U	17 U	**30,000**	**18 J**	17 U	**170**	17 U
VE-3 Manifold	**SP-115**	5/31/2007	ppbv	16 U	**60**	16 U	--	16 U	16 U	16 U	16 U	16 U	**310**	--	16 U	33 U	**420**	16 U	**68**	16 U	**23 J**	**37**	16 U	16 U	**4,200**	16 U
		7/31/2007	ppbv	5,400 U	5,400 U	5,400 UJ	--	5,400 U	5,400 U	5,400 U	5,400 U	5,400 U	**5,800 J**	5,400 U	5,400 U	1,1,000 U	**38,000**	5,400 U	5,400 U	5,400 U	5,400 U	5,400 U	5,400 U	5,400 U	**33,000**	5,400 U
		8/7/2007	ppbv	1,100 U	1,100 UJ	1,100 U	--	1,100 U	1,100 U	1,100 U	1,100 U	1,100 U	1,100 U	**27,000**	1,100 U	2,200 U	**20,0000 J**	1,100 U	1,100 U	1,100 U	1,100 U	1,100 U	**55,000 J**	1,100 U	**2**	1,100 U
		8/14/2007	ppbv	1.3 U	**2.4 J**	**3.6**	--	**24 J**	**1.7 J**	1.3 U	1.3 U	1.3 U	**6.2**	**31**	**1.5 J**	**3.8 J**	**440**	**1.9 J**	**2 J**	**2.2 J**	1.3 U	**230**	**39**	1.3 U	**20 J**	1.3 U
		9/5/2007	ppbv	9.4 U	**34**	9.4 UJ	**10 J**	**25 J**	9.4 U	**37**	9.4 U	9.4 U	**45**	**22**	9.4 U	19 U	**65**	9.4 U	**48**	9.4 U	**31**	**74**	**130**	9.4 U	**570**	9.4 U
		9/11/2007	ppbv	**59**	**520**	1.6 U	1.6 U	1.6 U	**650**	**16**	**71 J**	1.6 U	**2,600**	**14,000**	**84**	**480**	**110,000**	**81**	**38**	1.6 U	**91 J**	1.6 U	**24,000**	**14**	**3,600**	1.6 U
		9/18/2007	ppbv	**68**	**330**	14 U	14 UJ	14 U	**680**	**19 J**	**78**	14 U	**2,100**	**9,500**	**72**	**450**	**110,000**	**91**	**34**	14 U	**36**	14 U	**20,000**	14 U	**2,400**	14 U
		9/25/2007	ppbv	12 U	12 U	12 U	12 UJ	**20 J**	**94**	**33**	12 U	12 U	**300**	**2,700**	12 U	24 U	**30,000**	12 U	**14 J**	12 U	12 U	12 U	**800**	12 U	**150**	12 U
		10/1/2007	ppbv	270 U	270 U	270 U	270 UJ	270 U	**560**	270 U	270 U	270 U	**1,300**	**11,000**	270 U	540 U	**2**	270 U	270 U	270 U	270 U	270 U	**34,000**	270 U	**1,300**	270 U
		10/8/2007	ppbv	260 U	260 U	260 U	260 UJ	260 U	**560**	260 U	260 U	260 U	**1,000**	**8,400**	260 U	520 U	**110,000**	260 U	260 U	260 U	260 U	260 U	**24,000 J**	260 U	**1,100**	260 U
		10/15/2007	ppbv	290 U	290 U	290 U	290 U	290 U	**530 J**	290 U	290 U	290 UJ	**1,200**	**11,000**	290 U	580 U	**110,000**	290 U	290 U	290 U	290 U	290 U	**19,000**	290 U	**1,500 J**	290 U
		10/23/2007	ppbv	1.2 U	1.2 U	1.2 U	**7.8 J**	**28**	**1.6 J**	**2.2 J**	1.2 U	1.2 UJ	1.2 U	**3.3**	1.2 U	**2.7 J**	**7.5**	1.2 U	**7.8**	1.2 U	1.2 U	**20**	**20**	1.2 U	**1.6 J**	1.2 U
		10/29/2007	ppbv	270 U	270 U	270 U	270 UJ	270 U	270 U	270 U	270 U	270 UJ	**690**	**5,000**	270 U	550 U	**50,000**	270 U	270 U	270 U	270 U	270 U	**7,700**	270 U	**1,500**	270 U
		11/7/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	**520 J**	**5,600**	270 U	540 U	**49,000**	270 U	270 U	270 U	270 U	270 U	**7,300**	270 U	**1,600**	270 U
		11/15/2007	ppbv	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	**660 J**	**11,000**	420 U	850 U	**66,000**	420 U	420 U	420 U	420 U	420 U	**6,900**	420 U	**1,800**	420 U
		11/20/2007	ppbv	200 U	200 U	200 U	200 UJ	200 U	200 U	200 U	200 U	200 U	**560**	**7,700**	200 U	400 U	**73,000**	200 U	200 U	200 U	200 U	200 U	**3,600**	200 U	**2,800**	200 U
		11/27/2007	ppbv	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	330 U	**410 J**	**5,900**	330 U	660 U	**58,000**	330 U	330 U	330 U	330 U	330 U	**2,100**	330 U	**1,300**	330 U
		12/4/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**450 J**	**5,500**	250 U	490 U	**54,000**	250 U	250 U	250 U	250 U	250 U	**2,600**	250 U	**2,100**	250 U
		12/11/2007	ppbv	2.1 U	2.1 U	2.1 UJ	2.1 UJ	**42**	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	**8.6**	2.1 U	**6.9 J**	**56**	**2.7 J**	**4.9**	2.1 U	2.1 U	2.1 U	**93**	2.1 U	**26**	2.1 U
		12/20/2007	ppbv	220 U	220 U	220 UJ	220 UJ	**430 J**	220 U	220 U	220 U	220 U	**560**	**4,500**	220 U	450 U	**44,000**	220 U	**48,000**	220 U	220 U	220 U	**2,700**	220 U	**3,200**	220 U
		12/27/2007	ppbv	250 U	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	**430 J**	**3,500**	250 U	500 U	**33,000**	250 U	250 U	250 U	250 U	250 U	**1,800**	250 U	**3,400**	250 U
VE-4 Manifold	**SP-116**	5/31/2007	ppbv	14 U	**31**	14 U	--	**20 J**	14 U	**110**	14 U	14 U	**190**		14 U	29 U	**82**	14 U	**450**	14 U	**17 J**	**520**	14 U	**31**	**18,000**	14 U
		9/5/2007	ppbv	2.8 U	2.8 U	2.8 U	**210**	**310**	2.8 U	**8.7**	2.8 U	2.8 U	**4.1 J**	2.8 U	2.8 U	5.7 U	**20**	2.8 U	2.8 U	2.8 U	2.8 U	**640**	**32**	2.8 U	**7.1**	2.8 U
		9/18/2007	ppbv	0.8 U	0.8 U	0.8 U	**14 J**	**14**	**5.5**	**1.4 J**	0.8 U	0.8 U	**23**	**31**	**1.8**	**13**	**290**	**3**	**1.5 J**	0.8 U	0.8 U	**73**	**350**	0.8 U	**30**	0.8 U
		10/23/2007	ppbv	2.3 U	2.3 U	2.3 U	2.3 UJ	**36**	2.3 U	**3.4 J**	2.3 U	2.3 UJ	2.3 U	**6.7**	2.3 U	**5.7 J**	**46**	2.3 U	2.3 U	2.3 U	2.3 U	**15**	**31**	2.3 U	**3.5 J**	2.3 U
		10/29/2007	ppbv	270 U	270 U	270 U	270 UJ	270 U	**280 J**	270 U	270 U	270 UJ	**690**	**6,800**	270 U	540 U	**82,000**	270 U	270 U	270 U	270 U	270 U	**10,000**	270 U	**2,000**	270 U
DPE-A Manifold	**SP-111**	5/31/2007	ppbv	34 U	34 U	34 U	--	34 U	34 U	**99**	34 U	34 U	34 U	--	34 U	68 U	**220**	34 U	34 U	34 U	34 U	**790**	**300**	34 U	**190**	34 U
		6/5/2007	ppbv	3,200 U	3,200 U	3,200 U	--	3,200 U	3,200 U	3,200 U	3,200 U	3,200 U	**5100 J**	--	3,200 U	6,500 U	**300,000**	3,200 U	3,200 U	3,200 U	3,200 U	--	3,200 U	3,200 U	**29,000**	3,200 U
		6/14/2007	ppbv	3.6 U	3.6 U	3.6 U	--	3.6 U	**23**	**20**	3.6 U	3.6 U	**3,300**	**24,000**	**8**	**23**	**140,000**	3.6 U	**200**	3.6 U	**33**	--	**3,300**	**110**	**20,000**	3.6 U
		6/19/2007	ppbv	4,000 UJ	4,000 U	4,000 UJ	--	4,000 U	4,000 U	4,000 U	4,000 U	4,000 U	4,000 U	**22,000**	4,000 U	7,900 U	**160,000**	4,000 U	**5,400 J**	4,000 U	4,000 U	--	**4,500 J**	4,000 U	**14,000**	4,000 U
		7/11/2007	ppbv	2,700 U	2,700 U	2,700 U	--	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	**14,000**	2,700 U	5,400 U	**110,000**	2,700 U	2,700 U	2,700 U	2,700 U	--	**11,000**	2,700 U	**11,000**	2,700 U
		7/17/2007	ppbv	2,700 U	2,700 U	2,700 UJ	--	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	**12,000**	2,700 U	5,400 U	**94,000**	2,700 U	2,700 U	2,700 U	2,700 U	--	**11,000**	2,700 U	**6,600**	2,700 U
		7/25/2007	ppbv	1,200 U	1,200 U	1,200 UJ	--	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	**5,600**	1,200 U	2,300 U	**37,000**	1,200 U	1,200 U	1,200 U	1,200 U	--	**2**	1,200 U	**4,200**	1,200 U
		7/31/2007	ppbv	1,300 U	1,300 U	1,300 UJ	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**25,000**	1,300 U	2,600 U	**220,000**	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**30,000**	1,300 U	**3,800**	1,300 U
		8/7/2007	ppbv	13 U	13 U	13 U	--	**47 J**	**350 J**	**30**	**140**	13 U	**530 J**	**15,000**	**110**	**340**	**130,000 J**	**45**	13 U	13 U	**38**	**290**	**5,0000 J**	13 U	**710 J**	13 U
		8/14/2007	ppbv	**21**	**22**	**12**	--	**30 J**	**21**	**13**	**22**	**25**	**22**	**13**	**18**	**33**	15 UJ	**16**	**15**	**14**	**20**	**170**	**24**	**13**	**24**	**23**
		9/5/2007	ppbv	**22 J**	**120**	13 UJ	13 UJ	**26 J**	**540**	**28**	**94**	13 U	**890**	**8,500**	**58**	**300**	**75,000**	**43**	**24 J**	13 U	**17 J**	**23 J**	**41,000**	**22 J**	**2,400**	13 U
		9/11/2007	ppbv	13 U	13 U	13 U	**15 J**	**17 J**	**890 J**	13 U	**290**	13 U	**480**	**8,400**	**28**	**130**	**62,000**	**21**	**28**	13 U	**30**	13 U	**25,000**	13 U	**460**	13 U
		9/18/2007	ppbv	16 U	**35**	16 U	16 UJ	16 U	**480**	16 U	**89**	16 U	**59**	**3,800 J**	**38**	**200**	**35,000**	**34**	16 U	16 U	16 U	16 U	**26,000**	16 U	**56**	16 U
		9/25/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 UJ	**17**	1.4 U	**20**	1.4 U	1.4 UJ	1.4 U	**4.6**	1.4 U	2.7 U	**26**	1.4 U	**3 J**	1.4 U	1.4 U	**9.7**	**46**	1.4 U	**1.5 J**	1.4 U
		10/1/2007	ppbv	6.5 U	**11 J**	6.5 U	**8.4 J**	**11 J**	**280 J**	6.5 U	**25**	6.5 U	**22**	**2,700**	**16**	**110 J**	**2,8000 J**	**24**	6.5 U	6.5 U	6.5 U	**18**	**30,000 J**	6.5 U	**20**	6.5 U
		10/8/2007	ppbv	3 U	**9.8**	3 U	**10 J**	**15**	**170 J**	**8.9**	**22**	3 U	**79**	**690 J**	**10**	**110**	**600 J**	**28**	**3 J**	3 U	**5 J**	**25**	**8,400**	**11**	**49**	3 U
		10/15/2007	ppbv	6.4 U	6.4 U	6.4 U	6.4 U	**13**	**560 J**	6.4 U	**73**	6.4 UJ	**46**	**4,300**	**28**	**180**	**43,000**	**37**	6.4 U	6.4 U	**9.2 J**	250 UJ	**30,000**	6.4 U	**52 J**	6.4 U
		10/23/2007	ppbv	1.4 U	1.4 U	**3.7**	**12 J**	**29**	1.4 U	**3**	1.4 U	1.4 UJ	1.4 U	**4.8**	1.4 U	**3.1 J**	**30**	1.4 U	**6.6**	1.4 U	1.4 U	**20**	**23**	1.4 U	**1.8 J**	1.4 U
		10/29/2007	ppbv	1.4 U	**12**	1.4 U	1.4 UJ	**14**	**170 J**	**4.9**	**69 J**	1.4 UJ	**14**	**1,100**	**6.4 J**	**68**	**12,000**	**15**	**2.4 J**	1.4 U	**5.9**	**120 J**	**8,800**	1.4 U	**23**	1.4 U
		11/7/2007	ppbv	14 U	14 U	14 UJ	**370 J**	14 U	**53**	14 U	**45**	14 UJ	17 UJ	**430**	14 U	**28 J**	**4,300**	14 U	14 U	14 U	14 U	14 U	**1,800**	14 U	40 UJ	14 U
		11/15/2007	ppbv	14 U	14 U	14 U	14 U	14 U	**180**	14 U	**42**	14 U	**28**	**2,700 J**	14 U	**54 J**	**29,000**	14 U	14 U	14 U	14 U	14 U	**10,000**	14 U	**78**	14 U
		11/20/2007	ppbv	13 U	13 U	13 U	13 UJ	13 U	**340**	13 U	**73**	13 U	**26 J**	--	**25 J**	**150**	**39,000**	**31**	13 U	13 U	13 U	13 U	**16,000**	13 U	**36**	13 U
		11/27/2007	ppbv	12 U	12 U	12 U	12 U	12 U	**200**	12 U	**46**	12 U	**17 J**	**3,300 J**	12 U	**58**	**24,000**	UJ	12 U	12 U	12 U	12 U	**8,200**	12 U	**43**	12 U
		12/4/2007	ppbv	13 U	13 U	13 U	13 UJ	13 U	**260**	13 U	**48**	13 U	**19 J**	**3,400 J**	13 U	**87**	**25,000**	**20 J**	13 U	13 U	13 U	**140**	**10,000**	13 U	**34**	13 U
		12/11/2007	ppbv	1.2 U	1.2 U	1.2 UJ	**23 J**	**22**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**1.5 J**	1.2 U	2.4 U	**6.3**	1.2 U	**2.5**	1.2 U	**3.8**	**120**	**19**	1.2 U	**5.6**	1.2 U
		12/20/2007	ppbv	12 U	12 U	12 UJ	12 U	12 U	**300**	12 U	**61**	12 U	**19 J**	**3,800**	**27**	**180**	**30,000**	**41**	12 U	12 U	12 U	12 U	**12,000**	12 U	**41**	12 U
		12/27/2007	ppbv	13 U	13 U	13 U	13 UJ	13 U	**210**	13 UJ	**61**	13 U	**15 J**	**1,700**	**19 J**	**160**	**19,000**	**35**	13 U	13 U	13 U	13 U	**13,000**	13 U	**34 J**	13 U

Table 3.5
VOC Analytical Results for the Vapor Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Description	Station ID	Date	Analyte: / Units	1,1-Dichloroethane	1,1-Dichloroethene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	*m,p*-Xylene	n-Hexane	*o*-Xylene	Propylene	Styrene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane
DPE-B Manifold	SP-112	5/31/2007	ppbv	7.6 U	7.6 U	7.6 U	--	7.6 U	9.8 J	43	7.6 U	7.6 U	7.6 U	--	7.6 U	15 U	97	7.6 U	8.6 J	7.6 U	7.6 U	13 J	250	7.6 U	120	7.6 U
		6/5/2007	ppbv	2.9 J	1.6 U	1.6 U	--	4	62	12	1.6 U	1.6 U	41	1.6 U	1.6 U	3.3 U	2,000	1.6 U	1.7	1.6 U	15	--	14	1.6 U	240	1.6 U
		6/14/2007	ppbv	7.3 J	21	6.7 U	--	93	22	10 J	6.7 U	6.7 U	69	200	6.7 U	13 U	1,100 J	6.7 U	2,000	6.7 U	31	--	8.3 J	6.7 U	41	6.7 U
		6/19/2007	ppbv	320 U	320 U	320 U	--	730	320 U	320 U	320 U	320 UJ	320 U	320 U	320 U	650 U	880	320 U	880	320 U	320 U	--	320 U	320 U	320 U	320 U
		7/11/2007	ppbv	13 U	23 J	13 U	--	340	15 J	13 U	13 U	13 U	130	210	13 U	33 J	840	17 J	2,900	13 U	23 J	--	290	13 U	62	13 U
		7/17/2007	ppbv	13	33	5.7 UJ	--	380	64	7.6 J	5.7 U	5.7 U	190	310	13	40	780	21	3,000	5.7 U	31	--	37	5.7 U	62	5.7 U
		7/25/2007	ppbv	7.4 U	14 J	7.4 UJ	--	170	44	17	7.4 U	7.4 U	82	120	7.4 U	17 J	350 J	9.5 J	400	7.4 U	13 J	--	32	7.4 U	31	7.4 U
		7/31/2007	ppbv	12 U	73	12 U	--	160	31	13 J	12 U	12 U	190	250 UJ	12 U	25 U	970 UJ	12 U	390	12 U	26	950 J	49 UJ	12 U	490	12 U
		8/7/2007	ppbv	9.3	37	1.6 U	--	120 J	24 J	22	1.7 J	1.6 U	170 J	150 J	7.1	23	4,300 J	11	68 J	1.8 J	29	1,000 J	1,200	3.3	100 J	1.6 U
		8/14/2007	ppbv	1.3 U	1.3 U	8	--	36 J	1.3 U	12	1.3 U	1.3 U	2.2 J	15	1.3 U	2.7 U	51 J	1.3 U	15	1.3 U	1.3 U	72	10 UJ	11	4.9	1.3 U
		9/5/2007	ppbv	14 U	16 J	14 UJ	14 U	30 J	37	21 J	14 U	14 U	90	120	14 U	27 U	340	14 U	16 J	14 U	20 J	21 J	2,200	14 U	42 J	14 U
		9/11/2007	ppbv	15 U	15 U	15 U	15 U	15 U	22 J	15 U	15 U	15 U	32	84	16 J	36 J	310	15 U	15 U	15 U	34	15 U	3,600 J	15 U	31	15 U
		9/18/2007	ppbv	3.8	5.5	1.3 U	1.3 UJ	7.9 J	27	5.5	1.3 U	1.3 U	41	79	13	30	250	9.6	14	1.3 U	29	1.3 U	3,100	1.6 J	29	1.3 U
		9/25/2007	ppbv	1.3 U	1.3 U	1.3 U	4.5 J	16	1.3 U	7	1.3 U	1.3 UJ	1.3 U	2.4 J	1.3 U	2.7 U	13	1.3 U	3.7 J	1.3 U	1.3 U	19	23	1.3 U	1.3 U	1.3 U
		10/23/2007	ppbv	1.1 U	1.1 U	1.1 U	6.4 J	33	2.3	2.1 J	1.1 U	1.1 UJ	1.1 U	5.4	1.4 J	4.9	10	1.7 J	7.6	1.1 U	1.1 U	25	40	1.1 U	3.4	1.1 U
		10/29/2007	ppbv	1.3 U	1.3 U	1.3 U	6.1 J	5.4	31	4.3	2.8	1.3 UJ	32	100	1.4 J	6.9	280	2 J	2.2 J	1.3 U	14	29	450 J	2.9	17	1.3 U
		11/7/2007	ppbv	4 U	4 U	4 U	4 UJ	4 U	15	7.7 J	4 U	4 U	26	72 UJ	5.2 J	10 UJ	200 UJ	4.2 J	310	4 U	8.5	4 U	2,700	4 U	26 UJ	4 U
		11/15/2007	ppbv	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U	14 J	7.9 J	7.2 U	7.2 U	31	160	7.2 U	14 U	1,400	7.2 U	390	7.2 U	11 J	7.2 U	400	7.2 U	29	7.2 U
		11/20/2007	ppbv	6.8 U	6.8 U	6.8 U	6.8 UJ	6.8 U	21	6.8 U	6.8 U	66	27	99	16	25 J	370 J	9.3 J	1,800	6.8 U	17	6.8 U	5,700	6.8 U	21	6.8 U
		11/27/2007	ppbv	14 U	14 U	14 U	38	31	17 J	15 J	14 U	14 U	34	110	14 U	27 U	470	14 U	1,200	14 U	14 J	140	5,700	14 U	92	14 U
		12/4/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	3.9 UJ	3.8	1.4 U	1.4 U	1.4 U	4.5	8.6	1.6 J	2.9 J	19	1.4 U	450	1.4 U	2.4 J	1.4 U	2,300	1.4 U	3.3	1.4 U
		12/11/2007	ppbv	1.2 U	1.2 U	1.2 UJ	1.2 UJ	15	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.3 J	1.2 U	2.4 U	7.7	1.2 U	2.9	1.2 U	1.2 U	6.3	15	1.2 U	2.7	1.2 U
		12/20/2007	ppbv	12 U	12 U	12 UJ	12 U	12 U	16 J	12 U	12 U	12 U	29	60	12 U	24 U	190	12 U	42	12 U	17 J	12 U	3,100	12 U	29	12 U
		12/27/2007	ppbv	1.8 J	1.3 U	1.3 U	1.3 UJ	1.3 U	7.6	1.3 U	1.3 U	1.3 U	21	43	1.4 J	4.4 J	160	1.5 J	5.3	1.3 U	19	1.3 U	560 J	1.3 U	19	1.3 U
DPE-C Manifold	SP-114	5/31/2007	ppbv	14 U	14 U	14 U	--	14 U	14 U	14 U	14 U	14 U	14 U	140	14 U	28 U	190	14 U	100	14 U	15 J	--	14 U	14 U	100	14 U
		6/5/2007	ppbv	19 U	19 U	19 U	--	11	19 U	18	4	19 U	18	19 U	19 U	3 U	340	19 U	280	19 U	16	--	2 J	19 U	300	19 U
		6/14/2007	ppbv	6.7 U	19	6.7 U	--	7.4 J	6.7 U	24	7.2 J	6.7 U	34	190	6.7 U	13 U	360	6.7 U	16	6.7 U	24	--	6.7 U	6.7 U	160	6.7 U
		6/19/2007	ppbv	30 UJ	30 J	30 UJ	--	30 U	30 U	59 J	30 U	30 U	44 J	200	30 U	60 U	940	30 U	56 J	30 U	33 J	--	30 U	30 U	400	30 U
		7/11/2007	ppbv	14 U	18 J	14 U	--	21 J	14 U	14 U	14 U	14 U	26 J	91	14 U	28 U	230	14 U	14 U	14 U	26 J	--	540	14 U	270	14 U
		7/17/2007	ppbv	13 U	13 U	13 UJ	--	13 U	13 U	13 U	13 U	13 U	13 U	54	13 U	26 U	330	13 U	21 J	13 U	13 U	--	47	13 U	81	13 U
		7/25/2007	ppbv	6.4 U	9.1 J	6.4 UJ	--	17	6.4 U	25	6.4 J	6.4 U	10 J	28	6.4 U	13 U	110	6.4 U	6.4 U	6.4 U	7.2 J	--	58	6.4 U	130	6.4 U
		7/31/2007	ppbv	5.3	23	4.6	--	9.8 UJ	1.4 UJ	11	11	1.4 J	25 UJ	24 UJ	1.4 U	2.7 U	73 UJ	1.4 U	3.6	1.4 U	15	67	38 UJ	2.6 J	160	1.4 U
		8/7/2007	ppbv	14 U	16 J	14 U	--	30	14 U	21 J	14 U	14 U	14 U	34	14 U	27 U	140	14 U	14 U	14 U	18 J	730 J	210 J	14 U	72	14 U
		8/14/2007	ppbv	0.7 U	0.7 U	1 J	--	13 J	0.7 U	0.7 U	0.7 U	0.7 U	1 J	3.1	0.7 U	1.7 J	42	0.9 J	1.1 J	1 J	0.7 U	120	5.5 UJ	0.7 U	3.6 J	0.7 U
		9/5/2007	ppbv	14 U	61	14 U	14 U	18 J	14 U	28	28	14 U	30	24 J	14 U	27 U	270	14 U	14 U	14 U	22 J	47	160	14 U	100	14 U
		11/7/2007	ppbv	5.4	26	5.9	3 J	5	1.4 UJ	4.1	2.3 J	1.2 U	12 UJ	12 UJ	1.2 U	2.4 U	76 UJ	1.2 U	22	1.2 U	16	7.2	70 UJ	1.2 U	32 UJ	1.2 U
		11/15/2007	ppbv	6.8	35	1.3 UJ	1.3 UJ	3.1	2.2 J	23	3.1	1.3 U	11	32	1.3 U	2.5 U	330	1.3 U	1.3 U	1.3 U	9.3	16	120	1.3 U	30	1.3 U
		11/20/2007	ppbv	11	46	2.4	1.2 UJ	4.3	2.6	2 J	3.6	1.2 U	11	11	2.4	5.9	60	1.7 J	3.5	1.2 U	22	9.2	290	1.2 U	25	1.2 U
		11/27/2007	ppbv	13	56	2.7 U	2.7 UJ	34	2.7 U	12	4 J	33	40	41	2.7 U	5.5 U	72	2.7 U	650 J	2.7 U	27	19	74	2.7 U	120	2.7 U
		12/11/2007	ppbv	1.1 U	1.1 U	1.1 UJ	1.1 UJ	28	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.3 U	2.9	1.1 U	1.9 J	1.1 U	1.7 J	1.1 U	6.9 J	1.1 U	5.9	1.1 U
		12/27/2007	ppbv	10	77	1.1 U	1.1 UJ	3.5	1.1 U	1.1 UJ	1.7 J	1.1 U	9.6	3.9 UJ	2.6	5	28	1.5 J	3.5	1.1 U	47	4.6	41	1.1 U	26 J	1.1 U
DPE-D Manifold	SP-113	5/31/2007	ppbv	68	75	32 J	--	93	17 U	17 U	63	17 U	180	--	17 U	34 U	2,300	17 U	48,000	17 U	970	1,400	17 U	17 U	110	17 U
		6/5/2007	ppbv	35	19 J	20 J	--	98	16 U	16 U	16 U	16 U	110	--	16 J	32 U	1,100	16 U	27,000	16 U	160	--	16 U	16 U	65	16 U
		6/14/2007	ppbv	63	750	6.8 U	--	78	76	7.1 J	37	740	650	950	38	35	3,200	20	55,000	6.8 U	540	--	67	8.8 J	88	6.8 U
		6/19/2007	ppbv	300 U	300 U	300 U	--	610	300 U	300 U	300 U	300 UJ	300 U	920	300 U	610 U	1,900	300 U	43,000 J	300 U	830	--	300 U	300 U	300 U	300 U
		7/11/2007	ppbv	1,300 U	1,800 J	1,300 U	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	2,700 U	3,500	1,300 U	31,000	1,300 U	1,300 U	--	1,300 U	1,300 U	1,300 U	1,300 U
		7/17/2007	ppbv	260	1,600	13 UJ	--	24 J	13 J	13 U	16 J	13 U	730 J	1,000	13 U	26 U	2,200	13 U	32,000	13 U	580	--	35	13 U	340	13 U
		7/25/2007	ppbv	210	1,400	14 UJ	--	43	14 U	36	14 U	14 U	460	890	14 U	29 U	1,500	14 U	24,000	14 U	640 J	--	47	14 U	170	14 U
		7/31/2007	ppbv	260 U	1,200	260 UJ	--	260 U	260 U	260 U	260 U	260 U	520	930	260 U	510 U	2,300 UJ	260 U	14,000 J	260 U	260 J	13,000 J	270 UJ	260 U	2,200	260 U
		8/7/2007	ppbv	190	640	2.5 U	--	49 J	19 J	23	8.4	2.5 U	290	630 J	140 J	150 J	460	55	11,000 J	2.5 U	650	280	91	3.8 J	160 J	2.5 U
		8/14/2007	ppbv	1.3 U	1.3 U	1.3 U	--	20 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.7 U	6 UJ	1.3 U	1.5 J	1.3 U	1.3 U	6.6 UJ	2.1 UJ	1.3 U	2.1 J	1.3 U
		9/5/2007	ppbv	110	1,000	15 J	14 U	53 J	17 J	30	14 U	290	220	300	64	57	380	15 J	12,000	14 U	300	73	190	14 U	73 J	14 U
		9/11/2007	ppbv	110	740 J	230	14 U	16 J	18 J	14 U	42	590	230	380	43	51 J	870 J	15 J	2	14 U	550	15 J	280	14 U	92	14 U
		9/18/2007	ppbv	87	400	2.2 U	110 J	35	14	8.5	22	430	170	370	30	36	670	7.3	13,000	2.2 U	350	1,300	330	2.5 J	150	2.2 U
		9/25/2007	ppbv	5.1	1.6 J	1.4 U	1.4 UJ	25	2.1 J	46	1.4 U	1.4 UJ	10	58	1.4 U	2.8 U	--	1.4 U	2,100	1.4 U	1.6 J	4.5	120	1.4 U	5	1.4 U
		10/23/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 UJ	27	1.7 J	2 J	1.3 U	1.3 UJ	1.3 U	4.2	1.3 U	2.6 UJ	23	1.3 U	6.9	1.3 U	1.3 U	15	25	1.3 U	2 J	1.3 U
		10/29/2007	ppbv	62 J	190	1.4 U	4.9 J	14	12	7.4	4.4	360	160	220	46 J	41	320	5	10,000	1.4 U	120	16	160	1.4 U	32	1.4 U
		11/7/2007	ppbv	29	27	21 J	7 UJ	11 J	7 U	7 U	7 U	280	83	230 UJ	7 U	14 U	340 UJ	7 U	12,000	7 U	86	7 U	400 J	7 U	18 UJ	7 U
		11/27/2007	ppbv	48	94	6 U	6 U	6 U	6 U	14	12 J	430 J	120	280	6 U	12 U	420 J	6 U	11,000 J	6 U	180	6 U	43	6 U	34	6 U
		12/4/2007	ppbv	39	94	22 J	12 UJ	180	13 J	19 J	12 U	1,100 J	110	450	56	54	710	12 U	32,000	12 U	160	12 U	410	12 U	43	12 U
		12/11/2007	ppbv	2.3 U	2.3 U	2.3 UJ	2.3 UJ	51	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	4.6 U	5.6	2.3 U	2.7 J	2.3 U	2.3 U	7.2	13 J	2.3 U	2.9 J	2.3 U
		12/20/2007	ppbv	42	150	14 UJ	14 U	190	22 J	14 U	14 U	250	110	290	170	270	530	71	5,600	14 U	180	14 U	510	14 U	30	14 U
		12/27/2007	ppbv	49	200	11 U	11 UJ	11 U	15 J	11 U	11 U	11 U	110	310	120	170	400	37	6,400	11 U	230	11 U	88	11 U	32	11 U

Table 3.5
VOC Analytical Results for the Vapor Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Description	Station ID	Date	Units (Analyte:)	1,1-Dichloroethane	1,1-Dichloroethene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	*m,p*-Xylene	n-Hexane	*o*-Xylene	Propylene	Styrene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane
ERH Zone 801	**SP-801**	9/27/2007	ppbv	14 U	**150**	14 U	14 UJ	14 U	14 U	**18 J**	14 U	14 U	**300**	14 U	14 UJ	27 UJ	**29**	14 UJ	**30**	14 UJ	14 UJ	14 U	14 UJ	14 U	**320**	14 U
		10/1/2007	ppbv	**16 J**	**200**	13 U	13 UJ	13 U	13 U	**43**	13 U	13 U	**390**	**110**	13 UJ	27 UJ	**1,800**	13 UJ	**45**	13 UJ	13 UJ	13 U	**230 J**	13 U	**310**	13 U
		10/8/2007	ppbv	**19 J**	**180**	14 U	14 U	**22 J**	14 U	**62**	14 U	14 U	**330**	**33**	14 U	28 U	**84**	14 U	**74**	14 U	14 U	14 U	**22 J**	14 U	**450**	14 U
		10/15/2007	ppbv	**8.1**	**100**	1.3 U	39 UJ	**24**	**3.2**	**52**	**1.4 J**	1.3 UJ	**130**	**22**	1.3 U	**3.8 J**	**33**	**2 J**	**58 J**	1.3 U	**5.8**	110 UJ	**6.8**	**3.7**	**390**	1.3 U
		10/23/2007	ppbv	12 U	**60**	12 U	12 UJ	12 U	12 U	**69**	12 U	12 UJ	**84**	**75**	12 U	24 U	**54**	12 U	**96**	12 U	12 U	**230**	**58**	12 U	**550**	12 U
		10/30/2007	ppbv	13 U	**36**	13 U	13 UJ	**86**	13 U	**67**	13 U	13 UJ	**87**	**47**	13 U	26 U	**94**	13 U	**95**	13 U	**33**	**120**	**84**	13 U	**610**	13 U
		11/8/2007	ppbv	11 U	**23**	11 U	11 U	**28**	11 U	**19 J**	11 U	11 U	**35**	**39**	11 U	22 U	**67**	11 U	**750 J**	11 U	11 U	11 U	**510 J**	11 U	**720**	11 U
		11/15/2007	ppbv	14 U	**96**	14 UJ	14 UJ	**96**	14 U	**40**	14 U	14 U	**110**	**35**	14 U	27 U	**120**	14 U	**61**	14 U	14 U	**61**	**150**	14 U	**850**	14 U
		11/20/2007	ppbv	13 U	**68**	13 U	**21 J**	**140**	13 U	**39**	13 U	13 U	**84**	**75**	13 U	26 U	**140**	13 U	**58**	13 U	13 U	**31**	**130**	13 U	**1,200**	13 U
		11/27/2007	ppbv	13 U	**88**	13 U	13 U	**160**	13 U	**32**	13 U	13 U	**130**	**46**	13 U	26 U	**120**	13 U	**120**	13 U	13 U	**35**	**110**	13 U	**930**	13 U
		12/4/2007	ppbv	12 U	**88**	12 U	**23 J**	**230**	12 U	**30**	12 U	12 U	**140**	**62**	12 U	24 U	**100**	12 U	**88**	12 U	12 U	**27**	**72**	12 U	**1,900**	12 U
		12/11/2007	ppbv	9.5 U	**58**	9.5 U	**39**	**310**	9.5 U	**24**	9.5 U	9.5 UJ	**95**	**49**	9.5 U	19 U	**97**	9.5 U	**48**	9.5 U	9.5 U	**44**	**67**	9.5 U	**1,800**	9.5 U
		12/20/2007	ppbv	12 U	**17 J**	12 UJ	**68**	**630 J**	12 U	**25**	12 U	12 U	**63**	**54**	12 U	24 U	59 UJ	12 U	**250**	12 U	12 U	**28**	**62**	12 U	**2,000**	12 U
		12/27/2007	ppbv	13 U	**19 J**	13 U	13 UJ	**440**	13 U	13 U	13 U	13 U	**33**	**30**	13 U	25 U	**50**	13 U	**37**	13 U	13 U	13 U	**72**	13 U	**790 J**	13 U
ERH Zone 802	**SP-802**	9/27/2007	ppbv	290 U	290 U	290 U	290 UJ	290 U	**660**	290 U	290 U	290 UJ	**1,100**	**6,400**	290 UJ	570 U	**52,000**	290 U	290 U	290 U	290 U	290 U	**30,000**	290 U	**3,000**	290 U
		10/1/2007	ppbv	260 U	260 U	260 U	260 UJ	260 U	**400 J**	260 U	260 U	260 U	**810**	**3,600**	260 U	510 U	**29,000**	260 U	260 U	260 U	260 U	260 U	**19,000**	260 U	**2,300**	260 U
		10/8/2007	ppbv	270 U	270 U	270 U	270 UJ	270 U	270 U	270 U	270 U	270 U	**490 J**	**960**	270 U	530 U	**6,200**	270 U	270 U	270 U	270 U	270 U	**4,100**	270 U	**1,800**	270 U
		10/15/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	**350 J**	**1.7**	250 U	500 U	**16,000**	250 U	250 U	250 U	250 U	250 U	**1,900**	250 U	**2,000 J**	250 U
		10/23/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**460 J**	260 U	530 U	**2,800**	260 U	260 U	260 U	260 U	260 U	**940**	260 U	**2,000**	260 U
		10/30/2007	ppbv	260 U	260 U	260 U	260 UJ	260 U	**480 J**	260 U	260 U	260 UJ	**860**	**8,600**	260 U	520 U	**88,000**	260 U	260 U	260 U	260 U	**290 J**	**16,000 J**	260 U	**1,600**	260 U
		11/8/2007	ppbv	260 U	260 U	260 U	260 UJ	260 U	260 U	260 U	260 U	260 U	**320 J**	**280 J**	260 U	510 U	**1,200**	260 U	260 U	260 U	260 U	260 U	**910**	260 U	**5,000**	260 U
		11/15/2007	ppbv	250 U	250 U	250 UJ	250 UJ	250 U	250 U	250 U	250 U	250 U	**270 J**	**2,800**	250 U	490 U	**34,000**	250 U	250 U	250 U	250 U	250 U	**950**	250 U	**2,600**	250 U
		11/20/2007	ppbv	220 U	220 U	220 U	220 UJ	220 U	220 U	220 U	220 U	220 U	**370 J**	**8,200**	220 U	450 U	**69,000**	220 U	220 U	220 U	220 U	220 U	**3,300**	220 U	**5,200**	220 U
		11/27/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**4,000**	250 U	500 U	**28,000**	250 U	250 U	250 U	250 U	250 U	**1.7**	250 U	**3,100**	250 U
		12/4/2007	ppbv	240 U	240 U	240 U	240 U	**350 J**	240 U	240 U	240 U	240 U	**280 J**	**5,200**	240 U	480 U	**43,000**	240 U	240 U	240 U	240 U	240 U	**2,300**	240 U	**4,400**	240 U
		12/11/2007	ppbv	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 UJ	2,400 U	**5,400**	2,400 U	4900 U	**56,000**	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	2,400 U	**5,200**	2,400 U
		12/11/2007	ppbv	250 U	250 U	250 UJ	250 UJ	**490 J**	250 U	250 U	250 U	250 U	**520**	**1,700**	250 U	500 U	**13,000**	250 U	250 U	250 U	250 U	250 U	**810**	250 U	**5,500**	250 U
		12/11/2007	ppbv	240 U	240 U	240 U	240 UJ	240 U	240 U	240 U	240 U	240 U	**400 J**	**2,200**	240 U	490 U	**17,000**	240 U	240 U	240 U	240 U	240 U	**720**	240 U	**3,800**	240 U
ERH Zone 803	**SP-803**	9/27/2007	ppbv	270 U	**920**	270 U	270 UJ	270 U	**3,300**	270 U	270 U	270 UJ	**7,400**	**62,000**	**280 J**	**1,900**	**600,000**	**360 J**	270 U	270 U	270 U	270 U	**66,000**	270 U	**3,400**	270 U
		10/1/2007	ppbv	**160**	**630**	60 U	60 UJ	60 U	**2,400**	60 U	60 U	60 U	**5,400 J**	**1,600**	**210**	**1,300**	**38,000**	**260**	**79 J**	60 U	**63 J**	**850**	**3,400**	60 U	**2,300**	60 U
		10/8/2007	ppbv	**35**	**610**	2.5 U	2.5 UJ	2.5 U	**2,900**	**24**	2.5 U	**2.6 J**	**4,700 J**	**40,000**	**240**	**2,000**	**460,000 J**	**370**	**39**	2.5 U	**42 J**	2.5 U	**95,000**	2.5 U	**2,200**	**2.7 J**
		10/15/2007	ppbv	250 U	**680**	250 U	250 U	250 U	**2,500**	250 U	250 U	250 UJ	**4,700**	**47,000**	250 U	**2,100**	**46000**	**440 J**	250 U	250 U	250 U	250 U	**98,000**	250 U	**2,200**	250 U
		10/23/2007	ppbv	570 U	**1,100 J**	570 U	570 UJ	570 U	**3,800**	570 U	570 U	570 UJ	**6,200**	**37,000**	570 U	**2,800**	**400,000**	**680 J**	570 U	570 U	570 U	570 U	**73,000**	570 U	**5,500**	570 U
		10/30/2007	ppbv	260 U	**500 J**	260 U	260 UJ	260 U	**1.7**	260 U	260 U	260 UJ	**3,200**	**31,000**	260 U	**1.7**	**360,000**	**410 J**	260 U	260 U	**300 J**	260 U	**59,000**	260 U	**3,800**	260 U
		11/8/2007	ppbv	280 U	**370 J**	280 U	280 UJ	280 U	**1,400**	280 U	280 U	280 U	**2,300**	**28,000**	280 U	**1,400**	**350,000**	**330 J**	280 U	280 U	280 U	280 U	**52,000**	280 U	**3,700**	280 U
		11/15/2007	ppbv	270 U	**320 J**	270 UJ	270 UJ	270 U	**390 J**	270 U	270 U	270 U	**1,900**	**12,000**	270 U	540 U	**150,000**	270 U	270 U	270 U	270 U	270 U	**2**	270 U	**2,200**	270 U
		11/20/2007	ppbv	240 U	**330 J**	240 U	240 UJ	**260 J**	UJ	240 U	240 U	240 U	**1,900**	**13,000**	240 U	480 U	**160,000**	240 U	240 U	240 U	240 U	240 U	**11,000**	240 U	**3,100**	240 U
		11/27/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**1,900**	**1,2,000 J**	250 U	510 U	**120,000**	250 U	250 U	250 U	250 U	250 U	**11,000**	250 U	**2,200**	250 U
		12/4/2007	ppbv	230 U	230 U	230 U	230 U	230 U	**260 J**	230 U	230 U	230 U	**1.7**	**34,000**	230 U	460 U	**2**	230 U	230 U	230 U	230 U	**430 J**	**24,000**	230 U	**2,700**	230 U
		12/11/2007	ppbv	230 U	**270 J**	230 U	230 U	**360 J**	230 U	230 U	230 U	230 UJ	**1,300**	**9,800**	230 U	460 U	**110,000**	230 U	230 U	230 U	230 U	**370 J**	**8100**	230 U	**3,000**	230 U
		12/20/2007	ppbv	240 U	240 U	240 UJ	240 UJ	**400 J**	240 U	240 U	240 U	240 U	**1,500**	**6,800**	240 U	470 U	**56,000**	240 U	240 U	240 U	240 U	240 U	**5,300**	240 U	**3,500**	240 U
		12/27/2007	ppbv	220 U	220 U	220 U	220 UJ	220 U	220 U	220 U	220 U	220 U	**1,200**	**10,000**	220 U	440 U	**68,000**	220 U	220 U	220 U	220 U	220 U	**3,200**	220 U	**3,300**	220 U
ERH Zone 804	**SP-804**	9/27/2007	ppbv	270 U	270 U	270 U	270 UJ	270 U	**330 J**	270 U	270 U	270 UJ	**650**	**5300**	270 UJ	540 U	**66,000**	270 U	270 U	270 U	270 U	270 U	**14,000**	270 U	**1,200**	270 U
		10/1/2007	ppbv	13 U	**29**	13 U	13 UJ	13 U	13 U	**48**	13 U	13 U	**67**	**34**	13 UJ	26 UJ	**280**	13 UJ	**52**	13 UJ	13 UJ	**21 J**	**130**	13 U	**670**	13 U
		10/8/2007	ppbv	11 U	11 U	11 UJ	**75 J**	**11 J**	**48**	11 U	11 U	11 U	**63**	**570**	11 U	**32 J**	**4,400**	11 U	11 U	11 UJ	11 U	**580**	**2,000**	11 U	**34**	11 U
		10/15/2007	ppbv	12 U	12 U	12 U	110 UJ	**48**	12 U	**51**	12 U	12 UJ	**30**	**25 J**	12 UJ	25 UJ	**25**	12 UJ	**53**	12 UJ	12 UJ	**540 J**	12 UJ	12 U	**1,000**	12 U
		10/23/2007	ppbv	13 U	13 U	13 U	**290 J**	**84**	13 U	**41**	13 U	13 UJ	**58**	**63**	13 U	25 U	**64**	13 U	**60**	13 U	13 U		**170**	13 U	**1,500**	13 U
		10/30/2007	ppbv	22 U	22 U	22 U	22 UJ	**83**	22 U	**43 J**	22 U	22 UJ	**29 J**	**33 J**	22 U	45 U	**130**	22 U	**62**	22 U	22 U	**250**	**270**	22 U	**1,200**	22 U
		11/8/2007	ppbv	14 U	14 U	14 U	14 U	**130**	14 U	**32**	14 U	14 U	**42**	**39**	14 U	28 U	**44**	14 U	**150**	14 U	14 U	14 U	**540**	14 U	**1,600**	14 U
		11/15/2007	ppbv	14 U	14 U	14 U	14 U	**76**	14 U	**28 J**	14 U	14 U	**72**	**53**	14 U	28 U	**230**	14 U	**40**	14 U	14 U	**52**	**190**	14 U	**1,800**	14 U
		11/20/2007	ppbv	13 U	13 U	13 U	13 UJ	**240**	13 U	**51**	13 U	13 U	**67**	**59**	13 U	25 U	**150**	13 U	**49**	13 U	**15 J**	**35**	**190**	13 U	**1.7**	13 U
		11/27/2007	ppbv	13 U	13 U	13 U	13 U	**410**	13 U	**35**	13 U	13 U	**110**	**42**	13 U	27 U	**30**	13 U	**49**	13 U	**17 J**	**77**	**130**	13 U	**3,400**	13 U
		12/4/2007	ppbv	12 U	12 U	12 U	**58 J**	**560 J**	12 U	**36**	12 U	12 U	**75**	**65**	12 U	24 U	**44**	12 U	**73**	12 U	**13 J**	**43**	**35**	12 U	**2,500**	12 U
		12/11/2007	ppbv	13 U	13 U	13 U	**67 J**	**560**	13 U	**21 J**	13 U	13 U	**110**	**180**	13 U	26 U	**1,200 J**	13 U	**73**	13 U	**15 J**	**29**	**110**	13 U	**3,400**	13 U
		12/20/2007	ppbv	10 U	10 U	10 UJ	**220**	**570**	10 U	**22**	10 U	10 U	**140**	**47**	10 U	20 U	24 UJ	10 U	**57**	10 U	**16 J**	**690 J**	**54**	10 U	**3,200**	10 U
		12/27/2007	ppbv	12 U	12 U	12 U	12 UJ	**590 J**	12 U	**15 J**	12 U	12 U	**77**	**52**	12 U	24 U	**210**	12 U	**64**	12 U	12 U	12 U	**66**	12 U	**1,900**	12 U

Table 3.5
VOC Analytical Results for the Vapor Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Description	Station ID	Date	Units (Analyte:)	1,1-Dichloroethane	1,1-Dichloroethene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	*m,p*-Xylene	n-Hexane	*o*-Xylene	Propylene	Styrene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane
ERH Zone 805	**SP-805**	9/27/2007	ppbv	280 U	280 U	280 U	280 UJ	280 U	280 U	280 U	280 U	280 U	**320 J**	**290 J**	280 U	560 U	**2,800**	280 U	280 U	280 U	280 U	280 U	**1,200**	280 U	**1.7**	280 U
		10/1/2007	ppbv	2,700 U	**4,300 J**	2,700 U	2,700 UJ	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	**7500**	2,700 U	2,700 U	5,400 U	**11,000**	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	**8,600**	2,700 U
		10/8/2007	ppbv	**1.7 J**	1.3 U	1.3 U	**12 J**	**36**	**12**	**16**	**160**	1.3 U	**300**	**51**	1.3 U	**4.3 J**	**170**	**1.4 J**	**25**	1.3 U	**13**	**10**	**330**	**6.7**	**1,200**	1.3 U
		10/15/2007	ppbv	7.3 U	7.3 U	7.3 U	7.3 U	**22**	7.3 U	7.3 U	7.3 U	7.3 UJ	**16**	**88**	7.3 U	15 U	**1,200**	7.3 U	**9.5 J**	7.3 U	7.3 U	31 UJ	**120**	7.3 U	**56**	7.3 U
		10/23/2007	ppbv	5.4 U	**16**	5.4 U	**120 J**	**94**	**12**	**32**	**150**	5.4 UJ	**440**	**110**	5.4 U	11 U	**200**	5.4 U	**56**	5.4 U	**25**	**590**	**310**	**12**	**1,300**	5.4 U
		10/30/2007	ppbv	28 U	28 U	28 U	28 UJ	**110**	28 U	**29 J**	**250**	28 UJ	**350**	**130**	28 U	56 U	**350**	28 U	**90**	28 U	**33 J**	**170**	**400**	28 U	**1,200**	28 U
		11/8/2007	ppbv	8.5 U	**12 J**	8.5 U	8.5 UJ	**64**	8.5 U	**17 J**	**180**	8.5 U	**290**	**91**	8.5 U	17 U	**58**	8.5 U	**86**	8.5 U	**22**	**29**	**130**	**9 J**	**1,800**	8.5 U
		11/15/2007	ppbv	270 U	270 U	270 UJ	270 UJ	270 U	270 U	270 U	270 U	270 U	UJ	**14,000 J**	270 U	550 U	**150,000**	270 U	270 U	270 U	270 U	270 U	**3,300**	270 U	**1,200**	270 U
		11/20/2007	ppbv	4,100 U	4,100 U	4,100 U	4,100 UJ	4,100 U	4,100 U	4,100 U	4,100 U	4,100 U	4,100 U	**11,000**	4,100 U	8,200 U	**130,000**	4,100 U	4,100 U	4,100 U	4,100 U	4,100 U	**4,200 J**	4,100 U	**19,000**	4,100 U
		11/27/2007	ppbv	740 U	740 U	740 U	740 U	740 U	740 U	740 U	740 U	740 U	740 U	**13,000**	740 U	1,500 U	**130,000**	740 U	430 U	740 U	740 U	740 U	**4,000**	740 U	**1,600**	740 U
		12/4/2007	ppbv	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	**270 J**	**5,400**	230 U	470 U	**50,000**	230 U	230 U	230 U	230 U	230 U	**3,700**	230 U	**1,800**	230 U
		12/11/2007	ppbv	500 U	500 U	500 U	500 UJ	500 U	500 U	500 U	500 U	500 U	500 U	**5,200**	500 U	1,000 U	**53,000**	500 U	500 U	500 U	500 U	500 U	**2,600**	500 U	**2,000**	500 U
		12/20/2007	ppbv	240 U	240 U	240 UJ	240 UJ	240 U	240 U	240 U	240 U	240 U	**290 J**	**9,200**	240 U	480 U	**71,000**	240 U	240 U	240 U	240 U	240 U	**4,400**	240 U	**2,100**	240 U
		12/27/2007	ppbv	260 U	260 U	260 U	260 UJ	260 U	260 U	260 U	260 U	260 U	260 U	**3,600**	260 U	520 U	**25,000**	260 U	260 U	260 U	260 U	260 U	**3,000**	260 U	**2,300**	260 U

Notes:
Bolded results indicate positive detections.
Analyses were performed by EPA Region 9 laboratory using EPA Method TO-15 .
Only commonly detected in 2007 are listed in this table. For more detailed results, see Table A2.1 and the lab reports in Appendix 2.
ERH - electrical resistance heating
U - not detected above the stated reporting limit; UJ - not detected at estimated reporting limit; J - quantitative estimate
"--" - not available
ppbv - part per billion by volume

Table 3.6
VOC Analytical Results for the Influent to the Vapor Treatment System
Pemaco Superfund Site, Maywood, CA

Station ID	Date	Analyte: Units	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	Freon 113*	Hexachlorobutadiene	Isopropanol	*m,p*-Xylene	Methylene chloride	n-Hexane	*o*-Xylene	Propylene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
SP-102	5/14/2007	ppbv	**54 J**	**130 J**	15 UJ	15 UJ	15 UJ	15 UJ	--	**40 J**	**72 J**	15 UJ	**39 J**	15 UJ	15 UJ	**580 J**	--	**48 J**	15 UJ	15 UJ	15 UJ	**110 J**	15 UJ	**200,000**	**18 J**	**110 J**	**38 J**	--	**14,000**	15 UJ	**10,000**	**750 J**
SP-102	5/15/2007	ppbv	**46 J**	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	--	13 UJ	**110 J**	13 UJ	**32 J**	13 UJ	13 UJ	**720 J**	--	**95 J**	13 UJ	13 UJ	13 UJ	**210 J**	13 UJ	**200,000**	**36 J**	**63 J**	**48 J**	--	**33,000**	13 UJ	**13,000**	**540 J**
SP-102	5/17/2007	ppbv	120 U	**160 J**	120 U	120 U	120 U	120 U	--	120 U	**130 J**	120 U	120 U	120 U	120 U	**720**	--	120 U	120 U	120 UJ	120 U	240 U	**370**	**440,000**	120 U	**610**	120 U	--	**20,000**	**370**	**7,800**	**480**
SP-102	5/18/2007	ppbv	130 U	130 U	130 U	130 U	130 U	130 U	--	130 U	**160 J**	130 U	130 U	130 U	130 U	**870**	**19,000**	130 U	130 U	130 UJ	130 U	260 U	130 U	**120,000**	130 U	**1,700**	130 U	--	**46,000 J**	130 U	**9,700**	**550**
SP-102	5/21/2007	ppbv	140 U	140 U	140 U	140 U	140 U	140 U	--	140 U	140 U	140 U	140 U	140 U	140 U	**810**	**13,000**	140 U	140 U	140 UJ	140 U	290 U	140 U	**120,000**	140 U	**690**	140 U	--	**22,000**	140 U	**8,900**	**480**
SP-102	5/22/2007	ppbv	3.6 U	3.6 U	3.6 U	**27**	3.6 U	3.6 U	--	**30**	**22**	**5.7 J**	**9.8**	3.6 U	3.6 U	**600**	**4,700**	**5.1 J**	3.6 U	3.6 UJ	3.6 U	**10 J**	3.6 U	**17,000**	3.6 U	**2,700**	**170 J**	--	**35**	3.6 U	**6,600**	**170**
SP-102	5/29/2007	ppbv	6.7 U	6.7 U	6.7 UJ	6.7 U	6.7 U	6.7 U	--	6.7 UJ	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	**180 J**	**2,500**	6.7 U	6.7 U	6.7 UJ	6.7 U	13 U	6.7 U	**7,400**	6.7 U	**3,500**	**49**	--	**11 J**	6.7 U	**3,500 J**	**64 J**
SP-102	5/30/2007	ppbv	17 U	17 U	17 U	17 U	17 U	**17 J**	--	**21 J**	17 U	17 U	17 U	17 U	17 U	**370**	**4,300**	17 U	17 U	17 U	17 U	33 U	17 U	**17,000**	17 U	**8,200**	**130**	--	17 U	17 U	**3,900**	17 U
SP-102	5/31/2007	ppbv	15 U	15 U	15 UJ	15 U	15 U	15 U	--	15 U	15 U	15 U	15 U	15 U	15 U	**350**	**5,600**	15 U	15 U	15 UJ	15 U	30 U	15 U	**21,000**	15 U	**4,300**	**51**	--	**19 J**	15 U	**4,800**	**110**
SP-102	6/1/2007	ppbv	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	--	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	--	1,700 U	1,700 U	1,700 U	1,700 U	3,300 U	1,700 U	**48,000**	1,700 U	**4,900**	1,700 U	--	1,700 U	1,700 U	**6,500**	1,700 U
SP-102	6/4/2007	ppbv	2,900 U	2,900 U	2,900 U	2,900 U	2,900 U	2,900 U	--	2,900 U	2,900 U	2,900 U	2,900 U	2,900 U	2,900 U	2,900 U	--	2,900 U	2,900 U	2,900 U	2,900 U	5,800 U	2,900 U	**44,000**	2,900 U	**3,200 J**	2,900 U	--	2,900 U	2,900 U	**5,400 J**	2,900 U
SP-102	6/5/2007	ppbv	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	--	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	--	2,800 U	2,800 U	2,800 U	2,800 U	5,600 U	2,800 U	**58,000**	2,800 U	**3,300 J**	2,800 U	--	2,800 U	2,800 U	**5,900**	2,800 U
SP-102	6/6/2007	ppbv	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	--	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	--	1,600 U	1,600 U	1,600 U	1,600 U	3,300 U	1,600 U	**71,000**	1,600 U	**9,900**	1,600 U	--	1,600 U	1,600 U	**5,700**	1,600 U
SP-102	6/7/2007	ppbv	540 U	540 U	540 U	540 U	540 U	540 U	--	540 U	540 U	540 U	540 U	540 U	540 U	**1,400**	--	540 U	540 U	540 U	540 U	1,100 U	540 U	**54,000**	540 U	**11,000**	540 U	--	**1,100**	540 U	**6,500**	540 U
SP-102	6/8/2007	ppbv	510 U	510 U	510 U	510 U	510 U	510 U	--	510 U	510 U	510 U	510 U	510 U	510 U	**1,400**	--	510 U	510 U	510 U	510 U	1,000 U	510 U	**52,000**	510 U	**8,800**	510 U	--	**1,500**	510 U	**5,700**	510 U
SP-102	6/11/2007	ppbv	600 U	600 U	600 U	600 U	600 U	600 U	--	600 U	600 U	600 U	600 U	600 U	600 U	**1,200**	--	600 U	600 U	600 U	600 U	1,200 U	600 U	**40,000**	600 U	**5,700**	600 U	--	600 U	600 U	**5,100**	600 U
SP-102	6/12/2007	ppbv	280 U	280 U	280 U	280 U	280 U	280 U	--	280 U	280 U	280 U	280 U	280 U	280 U	**740**	--	280 U	280 U	280 U	280 U	550 U	280 U	**1,700**	280 U	**2,000**	280 U	--	280 U	280 U	**4,300**	280 U
SP-102	6/13/2007	ppbv	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	--	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	--	1,200 U	1,200 U	1,200 U	1,200 U	2,300 U	1,200 U	**38,000**	1,200 U	**2,400**	1,200 U	--	1,200 U	1,200 U	**3,100**	1,200 U
SP-102	6/14/2007	ppbv	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	--	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	**9,600**	1,600 U	1,600 U	1,600 U	1,600 U	3,200 U	1,600 U	**70,000**	1,600 U	**8,100**	1,600 U	--	1,600 U	1,600 U	**7,400**	1,600 U
SP-102	6/15/2007	ppbv	1,500 U	1,500 U	1,500 UJ	1,500 U	1,500 U	1,500 U	--	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	**8,400**	1,500 U	1,500 U	1,500 U	1,500 U	2,900 U	1,500 U	**62,000 J**	1,500 U	**5,000 J**	1,500 U	--	**2,400 J**	1,500 U	**6,200**	1,500 U
SP-102	6/18/2007	ppbv	1,000 U	1,000 U	1,000 UJ	1,000 U	1,000 U	1,000 U	--	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	**1,400 J**	**7,500**	1,000 U	1,000 U	1,000 U	1,000 U	2,100 U	1,000 U	**51,000**	1,000 U	**11,000**	1,000 U	--	**1,400 J**	1,000 U	**6,200**	1,000 U
SP-102	6/19/2007	ppbv	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	1,700 U	--	**2,900 J**	1,700 U	1,700 U	1,700 U	1,700 U	1,700 UJ	**1,700 J**	**9,300**	1,700 U	1,700 U	1,700 UJ	1,700 U	3,300 U	1,700 U	**72,000 J**	1,700 U	**3,700**	1,700 U	--	**2,500 J**	1,700 U	**7,600**	1,700 U
SP-102	6/20/2007	ppbv	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	--	**2,600 J**	1,500 U	1,500 U	1,500 U	1,500 U	1,500 UJ	**1,500 J**	**7,300**	1,500 U	1,500 U	1,500 UJ	1,500 U	3,000 U	1,500 U	**60,000**	1,500 U	**3,200**	1,500 U	--	**3,200**	1,500 U	**6,100**	1,500 U
SP-102	6/21/2007	ppbv	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	--	**2,400 J**	1,400 U	1,400 U	1,400 U	1,400 U	1,400 UJ	**1,500 J**	**8,200**	1,400 U	1,400 U	1,400 UJ	1,400 U	2,900 U	1,400 U	**64,000 J**	1,400 U	**3,200**	1,400 U	--	**2,200 J**	1,400 U	**6,700**	1,400 U
SP-102	7/9/2007	ppbv	1,600 U	1,600 U	1,600 UJ	1,600 U	1,600 U	1,600 U	--	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	**7,200**	1,600 U	1,600 U	1,600 UJ	1,600 UJ	3,200 U	1,600 U	**51,000**	1,600 U	1,600 U	1,600 U	--	**2,500 J**	1,600 U	**5,500**	1,600 U
SP-102	7/10/2007	ppbv	1,500 U	1,500 U	1,500 UJ	1,500 U	1,500 U	1,500 U	--	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	**7,600**	1,500 U	1,500 U	1,500 UJ	1,500 UJ	3,000 U	1,500 U	**57,000**	1,500 U	**2,500 J**	1,500 U	--	**3,400**	1,500 U	**5,400**	1,500 U
SP-102	7/11/2007	ppbv	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	--	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	**1,500 J**	**7,800**	1,500 U	1,500 U	1,500 UJ	1,500 UJ	3,100 U	1,500 U	**59,000**	1,500 U	**2,900 J**	1,500 U	--	**5,000**	1,500 U	**5,700**	1,500 U
SP-102	7/12/2007	ppbv	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	--	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	**6,400**	1,500 U	1,500 U	1,500 UJ	1,500 UJ	3,100 U	1,500 U	**48,000**	1,500 U	**3,100**	1,500 U	--	**5,100**	1,500 U	**4,900**	1,500 U
SP-102	7/16/2007	ppbv	1,400 U	1,400 U	1,400 UJ	1,400 U	1,400 U	1,400 UJ	--	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	**6,100**	1,400 U	1,400 U	1,400 UJ	1,400 U	2,800 U	1,400 U	**47,000**	1,400 U	**1,500 J**	1,400 U	--	**4,000**	1,400 U	**3,300**	1,400 U
SP-102	7/17/2007	ppbv	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 UJ	--	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	**6,300**	1,400 U	1,400 U	1,400 U	1,400 U	2,700 U	1,400 U	**51,000**	1,400 U	**3,300**	1,400 U	--	**5,700**	1,400 U	**3,900**	1,400 U
SP-102	7/18/2007	ppbv	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 UJ	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**6,000**	1,300 U	1,300 U	1,300 U	1,300 U	2,600 U	1,300 U	**49,000**	1,300 U	**3,100**	1,300 U	--	**5,700**	1,300 U	**3,200**	1,300 U
SP-102	7/19/2007	ppbv	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 UJ	--	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	1,400 U	**6,600**	1,400 U	1,400 U	1,400 U	1,400 U	2,900 U	1,400 U	**55,000**	1,400 U	**3,800**	1,400 U	--	**6,900**	1,400 U	**3,400**	1,400 U
SP-102	7/20/2007	ppbv	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 UJ	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**8,000**	1,300 U	1,300 U	1,300 UJ	1,300 U	2,600 U	1,300 U	**55,000 J**	1,300 U	**5,100**	1,300 U	--	**9,100**	1,300 U	**4,000**	1,300 U
SP-102	7/24/2007	ppbv	1,300 U	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 UJ	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**6,500**	1,300 U	1,300 U	1,300 UJ	1,300 U	2,700 U	1,300 U	**50,000 J**	1,300 U	**1,500 J**	1,300 U	--	**8,100**	1,300 U	**3,600**	1,300 U
SP-102	7/25/2007	ppbv	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 UJ	--	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	**8,700**	1,200 U	1,200 U	1,200 U	1,200 U	2,400 U	1,200 U	**57,000 J**	1,200 U	**2,800**	1,200 U	--	**12,000**	1,200 U	**4,300**	1,200 U
SP-102	7/26/2007	ppbv	250 U	**280 J**	250 U	250 U	250 U	250 UJ	--	250 U	250 U	250 U	250 U	250 U	250 U	**1,100**	**7,600**	250 U	250 U	250 U	250 U	490 U	250 U	**57,000 J**	250 U	**2,200**	250 U	--	**9,100**	250 U	**3,800**	250 U
SP-102	7/27/2007	ppbv	500 U	500 U	500 UJ	500 U	500 U	500 UJ	--	500 U	500 U	500 U	500 U	500 U	500 U	**730 J**	**6,400**	500 U	500 U	500 UJ	500 U	1,000 U	500 U	**35,000**	500 U	**2,400**	500 U	--	**6,200**	500 U	**2,900**	500 U
SP-102	7/30/2007	ppbv	530 U	530 U	530 UJ	530 U	530 U	530 UJ	--	530 U	530 U	530 U	530 U	530 U	530 U	**860 J**	**7,900**	530 U	530 U	530 UJ	530 U	1,100 U	530 U	**56,000**	530 U	**1,800**	530 U	--	**9,900**	530 U	**3,100**	530 U
SP-102	7/31/2007	ppbv	2,800 U	2,800 U	2,800 UJ	2,800 U	2,800 U	2,800 UJ	--	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	2,800 U	**11,000**	2,800 U	2,800 U	2,800 UJ	2,800 U	5,500 U	2,800 U	**110,000**	2,800 U	2,800 U	2,800 U	2,800 U	**10,000**	2,800 U	**13,000**	2,800 U
SP-102	8/1/2007	ppbv	2,500 U	2,500 U	2,500 UJ	2,500 U	2,500 U	2,500 UJ	--	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	**12,000**	2,500 U	2,500 U	2,500 UJ	2,500 U	5,100 U	2,500 U	**100,000**	2,500 U	2,500 U	2,500 U	--	**8,200**	2,500 U	**10,000**	2,500 U
SP-102	8/2/2007	ppbv	2,300 U	2,300 U	2,300 UJ	2,300 U	2,300 U	2,300 UJ	--	2,300 U	2,300 U	2,300 U	2,300 U	2,300 U	2,300 U	2,300 U	**17,000**	2,300 U	2,300 U	2,300 UJ	2,300 U	4,500 U	2,300 U	**150,000 J**	2,300 U	2,300 U	2,300 U	2,300 U	**6,500**	2,300 U	**9,800**	2,300 U
SP-102	8/3/2007	ppbv	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	2,600 UJ	--	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	**14,000**	2,600 U	2,600 U	2,600 U	2,600 U	5,200 U	2,600 U	**13,0000 J**	2,600 U	2,600 U	2,600 U	--	**11,000**	2,600 U	**6,900**	2,600 U
SP-102	8/6/2007	ppbv	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 UJ	--	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	1,500 U	**1,900 J**	**17,000**	1,500 U	1,500 U	1,500 U	1,500 U	3,000 U	1,500 U	**120,000 J**	1,500 U	1,500 U	1,500 U	--	**32,000**	1,500 U	**6,200**	1,500 U
SP-102	8/7/2007	ppbv	640 U	640 U	640 U	640 U	640 U	640 U	--	640 U	640 U	640 U	640 U	640 U	640 U	**2,000**	**15,000**	640 U	640 U	640 U	640 U	1,300 U	640 U	**17,0000 J**	640 U	**830 J**	640 U	640 U	**36,000 J**	640 U	**7,600**	640 U
SP-102	8/8/2007	ppbv	2,600 U	2,600 U	2,600 UJ	2,600 U	2,600 U	2,600 U	--	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	2,600 U	**9,300**	2,600 U	2,600 U	2,600 UJ	2,600 U	5,200 U	2,600 U	**81,000**	2,600 U	2,600 U	2,600 U	--	**25,000 J**	2,600 U	**6,200**	2,600 U
SP-102	8/9/2007	ppbv	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 U	1,300 U	--	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**1,900 J**	**12,000**	1,300 U	1,300 U	1,300 U	1,300 U	2,700 U	1,300 U	**86,000**	1,300 U	**1,900 J**	1,300 U	--	**35,000**	1,300 U	**6,300**	1,300 U
SP-102	8/10/2007	ppbv	22 U	22 U	22 UJ	**74**	22 U	22 U	--	22 U	**430**	22 U	22 U	**85**	22 U	**470**	**11,000**	**87**	22 U	22 UJ	22 U	**370**	22 U	**82,000**	**61**	**1,300 J**	**82**	--	**36,000 J**	22 U	**740**	22 U
SP-102	8/13/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	--	240 U	240 U	240 U	240 U	240 U	240 U	240 U	**5,600**	240 U	240 U	240 U	240 U	490 U	240 U	**72,000 J**	240 U	**1,100 J**	240 U	--	**26,000 J**	240 U	**670**	240 U
SP-102	8/14/2007	ppbv	260 U	260 U	260 UJ	260 U	260 U	260 U	--	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**4,300**	260 U	260 U	260 UJ	260 U	520 U	260 U	**55,000 J**	260 U	**1,100 J**	260 U	260 U	**20,000 J**	260 U	**850**	260 U
SP-102	8/15/2007	ppbv	7.6 U	**120**	7.6 UJ	7.6 U	7.6 U	7.6 U	--	**21 J**	**130 J**	7.6 U	7.6 U	**37**	7.6 U	**340**	**2,100**	**17**	**20**	7.6 U	7.6 UJ	**73**	7.6 U	**19,000**	**11 J**	**520 J**	**33**	--	**7,400**	**14 J**	**600 J**	**33**
SP-102	8/16/2007	ppbv	**40**	**280**	14 UJ	14 U	14 U	14 U	--	**47 J**	**260 J**	**35**	14 U	**72**	14 U	**660**	**5,100**	**36**	**41**	14 U	14 UJ	**160**	14 U	**51,000**	**25 J**	**1,300**	**69**	--	**20,000**	**28**	**1,600 J**	**67**
SP-102	8/17/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 UJ	--	270 U	270 U	270 U	270 U	270 U	270 U	**500 J**	**4,200**	270 U	270 U	270 U	270 U	540 U	270 U	**59,000 J**	270 U	**870**	270 U	--	**23,000**	270 U	**1,200**	270 U
SP-102	8/20/2007	ppbv	230 U	230 U	230 U	230 U	230 U	230 UJ	--	230 U	230 U	230 U	230 U	230 U	230 U	**340 J**	**3,100**	230 U	230 U	230 U	230 U	460 U	230 U	**46,000**	230 U	**500**	230 U	--	**17,000**	230 U	**860**	230 U
SP-102	9/4/2007	ppbv	**31**	**200**	14 U	14 U	14 U	14 UJ	**58**	**39 J**	**360**	14 U	14 U	**76**	14 U	**520**	**4,700**	**42**	14 U	14 U	14 U	**170**	14 U	**69,000**	**26 J**	**980**	**48**	**500**	**16,000**	**19 J**	**1,100 J**	**51**
SP-102	9/5/2007	ppbv	14 U	**100**	14 U	14 U	14 U	14 UJ	**42**	**33 J**	**190**	14 U	14 U	**39**	14 U	**320**	**2,900**	**21 J**	14 U	14 U	14 U	**84**	14 U	**42,000**	**14 J**	**450**	**26 J**	**400**	**11,000**	14 U	**600**	**27 J**
SP-102	9/6/2007	ppbv	**33 J**	**220**	17 U	17 U	17 U	17 U	17 U	**22 J**	**320**	17 U	17 U	**73**	17 U	**610**	**6,200**	**35**	17 U	17 U	17 U	**130**	17 U	**74,000**	**22 J**	**1,200**	**57**	**35**	**15,000**	**18 J**	**1,700**	**54**
SP-102	9/7/2007	ppbv	**54**	**960**	16 U	**17 J**	16 U	16 U	16 U	**29 J**	**190**	**46**	16 U	**95**	16 U	**3,100**	**11,000**	**27 J**	16 U	16 U	16 U	**110**	16 U	**180,000**	**20 J**	**990**	**55**	**44**	**8,100**	**56**	**13,000**	**250**
SP-102	9/10/2007	ppbv	17 U	**670**	17 U	17 U	17 U	17 U	17 U	**26 J**	**460**	**24 J**	17 U	**100**	17 U	**3,400**	**13,000**	**37**	17 U	17 U	17 U	**200**	17 U	**230,000**	**31 J**	**450**	**48**	**55**	**20,000**	**40**	**6,500**	**180**
SP-102	9/11/2007	ppbv	15 U	**660**	15 U	**44**	**17 J**	**53**	15 U	**19 J**	**780**	**22 J**	15 U	**160**	**31**	**2,500**	**12,000**	**95**	**120**	15 U	15 U	**530**	15 U	**140,000 J**	**84**	**990**	**100**	15 U	**22,000**	**48**	**3,900**	**210**
SP-102	9/12/2007	ppbv	1,300 U	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**2,600**	**18,000**	1,300 U	1,300 U	1,300 U	1,300 U	2,600 U	1,300 U	**120,000**	1,300 U	1,300 U	1,300 U	1,300 U	**34,000**	1,300 U	**3,900**	1,300 U
SP-102	9/13/2007	ppbv	**380 J**	280 U	280 UJ	280 U	280 U	280 U	280 UJ	280 U	**620**	280 U	280 U	280 U	280 U	**1,900**	**16,000**	280 U	280 U	280 U	280 U	570 U	280 U	**110,000**	280 U	**1,000**	280 U	280 U	**30,000**	280 U	**2,700**	280 U
SP-102	9/14/2007	ppbv	1,300 U	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 U	1,300 UJ	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	1,300 U	**2,200 J**	**14,000**	1,300 U	1,300 U	1,300 U	1,300 U	2,600 U	1,300 U	**100,000**	1,300 U	**1,400 J**	1,300 U	1,300 U	**28,000**	1,300 U	**2,900**	1,300 U
SP-102	9/17/2007	ppbv	620 U	620 U	620 UJ	620 U	620 U	620 U	620 UJ	620 U	**740 J**	620 U	620 U	620 U	620 U	**2,000**	**12,000**	620 U	620 U	620 U	620 U	1,200 U	620 U	**93,000**	620 U	**820 J**	620 U	620 U	**19,000**	620 U	**2,100**	620 U
SP-102	9/18/2007	ppbv	680 U	680 U	680 UJ	680 U	680 U	680 U	680 UJ	680 U	**710 J**	680 U	680 U	680 U	680 U	**1,900**	**12,000**	680 U	680 U	680 U	680 U	1,400 U	680 U	**89,000**	680 U	**830 J**	680 U	680 U	**20,000**	680 U	**2,300**	680 U
SP-102	9/19/2007	ppbv	270 U	270 U	270 UJ	270 U	270 U	270 U	270 UJ	270 U	**620**	270 U	270 U	270 U	270 U	**1,700**	**10,000**	270 U	270 U	270 U	270 U	540 U	270 U	**86,000**	270 U	**620**	270 U	270 U	**20,000**	270 U	**1,900**	270 U
SP-102	9/20/2007	ppbv	260 U	260 U	260 UJ	260 U	260 U	260 U	260 UJ	260 U	**600**	260 U	260 U	260 U	260 U	**1,600**	**9,600**	260 U	260 U	260 U	260 U	520 U	260 U	**100,000**	260 U	**660**	260 U	260 U	**23,000**	260 U	**1,700**	260 U
SP-102	9/21/2007	ppbv	230 U	230 U	230 UJ	230 U	230 U	230 U	230 UJ	230 U	**300 J**	230 U	230 U	230 U	230 U	**680**	**4,900**	230 U	230 U	230 UJ	230 U	450 U	230 U	**50,000**	230 U	**460**	230 U	230 U	**10,000**	230 U	**740**	230 U
SP-102	9/24/2007	ppbv	270 U	270 U	270 UJ	270 U	270 U	270 U	270 UJ	270 U	**640**	270 U	270 U	270 U	270 U	**1,300**	**9,000**	270 U	270 U	270 UJ	270 U	540 U	270 U	**94,000**	270 U	**600**	270 U	270 U	**25,000**	270 U	**1,300**	270 U
SP-102	9/25/2007	ppbv	250 U	250 U	250 UJ	250 U	250 U	250 U	250 UJ	250 U	**550**	250 U	250 U	250 U	250 U	**1,000**	**8,300**	250 U	250 U	250 U	250 U	500 U	250 U	**83,000**	250 U	**650**	250 U	250 U	**24,000**	250 U	**1,100**	250 U

Table 3.6
VOC Analytical Results for the Influent to the Vapor Treatment System
Pemaco Superfund Site, Maywood, CA

Station ID	Date	Analyte: Units	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	Freon 113*	Hexachlorobutadiene	Isopropanol	*m,p*-Xylene	Methylene chloride	n-Hexane	*o*-Xylene	Propylene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
SP-102	9/26/2007	ppbv	280 U	280 U	280 U	280 U	280 U	280 U	280 UJ	280 U	280 U	280 U	280 U	280 U	280 UJ	**440 J**	**4,000**	280 U	280 U	280 U	280 U	560 U	280 U	**46,000**	280 U	280 U	280 U	280 U	**10,000**	280 U	**500**	280 U
SP-102	9/27/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 UJ	270 U	**680**	270 U	270 U	270 U	270 UJ	**1,300**	**10,000**	270 U	270 U	270 U	270 U	540 U	270 U	**180,000**	270 U	270 UJ	270 U	270 U	**35,000**	270 U	**1,400**	270 U
SP-102	9/28/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	**600**	250 U	250 U	250 U	250 UJ	**1,100**	**9,900**	250 U	250 U	250 U	250 U	490 U	250 U	**120,000**	250 U	250 U	250 U	250 U	**27,000**	250 U	**1,100**	250 U
SP-102	10/1/2007	ppbv	280 U	280 U	280 U	280 U	280 U	280 U	280 UJ	280 U	**630**	280 U	280 U	280 U	280 UJ	**1,200**	**10,000**	280 U	280 U	280 U	280 U	550 U	280 U	**130,000**	280 U	280 U	280 U	280 U	**35,000**	280 U	**1,200**	280 U
SP-102	10/2/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	**650**	260 U	260 U	260 U	260 UJ	**1,300**	**12,000**	260 UJ	260 U	260 U	260 U	510 U	260 U	**140,000**	260 U	260 U	260 U	260 U	**38,000**	260 U	**1,300**	260 U
SP-102	10/3/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 UJ	270 U	**710**	270 U	270 U	270 U	270 UJ	**1,300**	**12,000**	270 UJ	270 U	270 U	270 U	550 U	270 U	**140,000**	270 U	270 U	270 U	270 U	**39,000**	270 U	**1,400**	270 U
SP-102	10/4/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 UJ	270 U	**680**	270 U	270 U	270 U	270 UJ	**1,200**	**10,000**	270 UJ	270 U	270 U	270 U	540 U	270 U	**13,0000 J**	270 U	270 U	270 U	270 U	**35,000**	270 U	**1,200**	270 U
SP-102	10/5/2007	ppbv	2,700 U	**4,200 J**	2,700 U	2,700 U	2,700 U	2,700 U	2,700 UJ	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	2,700 U	**7,700**	**11,000**	2,700 U	2,700 U	2,700 U	2,700 U	5,300 U	2,700 U	**13,0000 J**	2,700 U	2,700 U	2,700 U	2,700 U	**40,000**	2,700 U	**8,100**	2,700 U
SP-102	10/8/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	**620**	260 U	260 U	260 U	260 U	**1,000**	**8,300**	260 U	260 U	260 U	260 U	530 U	260 U	**110,000 J**	260 U	260 U	260 U	260 U	**40,000**	260 U	**1,200**	260 U
SP-102	10/9/2007	ppbv	280 U	280 U	280 U	280 U	280 U	280 U	280 UJ	280 U	**530 J**	280 U	280 U	280 U	280 U	**870**	**8,300**	280 U	280 U	280 U	280 U	570 U	280 U	**86,000**	280 U	280 U	280 U	280 U	**16,000**	280 U	**1,000**	280 U
SP-102	10/10/2007	ppbv	260 U	260 U	260 UJ	260 U	260 U	260 U	260 UJ	260 U	**360 J**	260 U	260 U	260 U	260 U	**620**	**5,900**	260 U	260 U	260 U	260 U	530 U	260 U	**62,000**	260 U	260 U	260 U	260 U	**11,000**	260 U	**720**	260 U
SP-102	10/11/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 UJ	270 U	**430 J**	270 U	270 U	270 U	270 U	**770**	**7,700**	270 U	270 U	270 U	270 U	540 U	270 U	**86,000**	270 U	270 U	270 U	270 U	**15,000**	270 U	**920**	270 U
SP-102	10/12/2007	ppbv	280 U	280 U	280 U	280 UJ	280 UJ	280 UJ	280 UJ	280 U	**420 J**	280 U	280 U	280 U	280 U	**880**	**7,600**	280 U	280 U	280 U	280 U	550 U	280 U	**74,000**	280 U	280 U	280 U	280 U	**13,000**	280 U	**910**	280 U
SP-102	10/15/2007	ppbv	260 U	260 U	260 U	260 UJ	260 UJ	260 UJ	260 UJ	260 U	**350 J**	260 U	260 U	260 U	260 U	**810**	**7,200**	260 U	260 U	260 U	260 U	510 U	260 U	**72,000**	260 U	260 U	260 U	260 U	**12,000**	260 U	**1,000**	260 U
SP-102	10/16/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**450 J**	260 U	260 U	260 U	260 UJ	**1,100**	**8,300**	260 U	260 U	260 U	260 U	530 U	260 U	**87,000**	260 U	260 U	260 U	260 U	**14,000**	260 U	**1,100 J**	260 U
SP-102	10/17/2007	ppbv	290 U	290 U	290 U	290 U	290 U	290 U	**1,700**	290 U	**440 J**	290 U	290 U	290 U	290 UJ	**950**	**8,100**	290 U	290 U	290 U	290 U	580 U	290 U	**79,000**	290 U	290 U	290 U	290 U	**14,000**	290 U	**1,200 J**	290 U
SP-102	10/18/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**430 J**	250 U	250 U	250 U	250 UJ	**940**	**7,900**	250 U	250 U	250 U	250 U	500 U	250 U	**85,000**	250 U	250 U	250 U	250 U	**19,000**	250 U	**1,300**	250 U
SP-102	10/19/2007	ppbv	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 U	410 UJ	**800 J**	**6,200**	410 U	410 U	410 U	410 U	830 U	410 U	**86,000 J**	410 U	410 U	410 U	410 U	**12,000**	410 U	**910**	410 U
SP-102	10/22/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**390 J**	260 U	260 U	260 U	260 UJ	**850**	**6,800**	260 U	260 U	260 U	260 U	520 U	260 U	**71,000**	260 U	**670**	260 U	260 U	**15,000**	260 U	**1,200**	260 U
SP-102	10/23/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**350 J**	260 U	260 U	260 U	260 UJ	**810**	**6,700**	260 U	260 U	260 U	260 U	520 U	260 U	**68,000**	260 U	**450 J**	260 U	260 U	**15,000**	260 U	**2,100**	260 U
SP-102	10/24/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**340 J**	260 U	260 U	260 U	260 UJ	**800**	**6,500**	260 U	260 U	260 U	260 U	520 U	260 U	**67,000**	260 U	**590**	260 U	260 U	**13,000**	260 U	**1,500**	260 U
SP-102	10/25/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	**310 J**	250 U	250 U	250 U	250 UJ	**680**	**5,700**	250 U	250 U	250 U	250 U	510 U	250 U	**62,000**	250 U	**570**	250 U	250 U	**12,000**	250 U	**1,400**	250 U
SP-102	10/26/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	**270 J**	260 U	260 U	260 U	260 UJ	**550**	**5,500**	260 U	260 U	260 U	260 U	530 U	260 U	**57,000**	260 U	**640**	260 U	260 U	**10,000**	260 U	**1,100**	260 U
SP-102	10/29/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	**270 J**	260 U	260 U	260 U	260 UJ	**540**	**5,200**	260 U	260 U	260 U	260 U	530 U	260 U	**55,000**	260 U	**430 J**	260 U	260 U	**10,000**	260 U	**1,100**	260 U
SP-102	10/30/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	**280 J**	260 U	260 U	260 U	260 UJ	**530**	**5,600**	260 U	260 U	260 U	260 U	520 U	260 U	**54,000**	260 U	260 U	260 U	260 U	**9,000**	260 U	**1,400**	260 U
SP-102	10/31/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	250 UJ	250 U	250 U	250 U	250 UJ	**400 J**	**5,300**	250 U	250 U	250 U	250 U	500 U	250 U	**58,000**	250 U	**570**	250 U	250 U	**9,400**	250 U	**1,400**	250 U
SP-102	11/1/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	250 UJ	250 U	250 U	250 U	250 UJ	**490 J**	**5,100**	250 U	250 U	250 U	250 U	500 U	250 U	**50,000**	250 U	**700**	250 U	250 U	**9,100**	250 U	**1,400**	250 U
SP-102	11/2/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	270 U	**440 J**	**4,400**	270 U	270 U	270 U	270 U	540 U	270 U	**41,000**	270 U	**760**	270 U	270 U	**8,600**	270 U	**1,300**	270 U
SP-102	11/5/2007	ppbv	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	**430 J**	**4,100**	300 U	300 U	300 U	300 U	600 U	300 U	**39,000**	300 U	**950**	300 U	300 U	**8,600**	300 U	**1,400**	300 U
SP-102	11/6/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**490 J**	**3,100**	260 U	260 U	260 U	260 U	520 U	260 U	**24,000**	260 U	**680**	260 U	260 U	**6,700**	260 U	**3,800**	260 U
SP-102	11/7/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	**420 J**	**4,300**	260 U	260 U	260 U	260 U	530 U	260 U	**43,000**	260 U	**720**	260 U	260 U	**8,000**	260 U	**1,500**	260 U
SP-102	11/8/2007	ppbv	260 U	260 U	260 UJ	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**400 J**	**4,100**	260 U	260 U	260 U	260 U	510 U	260 U	**42,000**	260 U	**1,200**	260 U	260 U	**9,200**	260 U	**1,900**	260 U
SP-102	11/14/2007	ppbv	250 U	250 U	250 UJ	250 U	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	250 UJ	**340 J**	**3,900**	250 U	250 U	250 U	250 U	490 U	250 U	**51,000**	250 U	250 U	250 U	250 U	**4,700**	250 U	**1,400**	250 UJ
SP-102	11/15/2007	ppbv	240 U	240 U	240 UJ	240 U	240 U	240 UJ	240 UJ	240 U	240 U	240 U	240 U	240 U	240 U	**290 J**	**4,700**	240 U	240 U	240 U	240 U	490 U	240 U	**44,000**	240 U	240 U	240 U	240 U	**4,700**	240 U	**1,100**	240 U
SP-102	11/16/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	**390 J**	**2,000**	240 U	240 U	240 U	240 U	480 U	240 U	**22,000**	240 U	**310 J**	240 U	240 U	**2,300**	240 U	**3,000**	240 U
SP-102	11/19/2007	ppbv	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	220 U	**370 J**	**4,400**	220 U	220 U	220 U	220 U	430 U	220 U	**47,000**	220 U	220 U	220 U	220 U	**4,400**	220 U	**1,800**	220 U
SP-102	11/20/2007	ppbv	230 U	230 U	230 U	230 U	230 U	230 U	230 UJ	230 U	230 U	230 U	230 U	230 U	230 U	**320 J**	**5,100**	230 U	230 U	230 U	230 U	460 U	230 U	**51,000**	230 U	230 U	230 U	230 U	**4,700**	230 U	**1,600**	230 U
SP-102	11/21/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	250 U	**310 J**	**4,800**	250 U	250 U	250 U	250 U	500 U	250 U	**45,000**	250 U	**470 J**	250 U	250 U	**5,300**	250 U	**1,400**	250 U
SP-102	11/26/2007	ppbv	270 U	270 U	270 U	270 U	270 U	270 U	270 UJ	270 U	270 U	270 U	270 U	270 U	270 U	**280 J**	**3,900**	270 U	270 U	270 U	270 U	540 U	270 U	**34,000**	270 U	270 U	270 U	270 U	**2,700**	270 U	**1,400**	270 U
SP-102	11/27/2007	ppbv	260 U	260 U	260 U	260 U	260 U	260 U	260 UJ	260 U	260 U	260 U	260 U	260 U	260 U	260 U	**3,900**	260 U	260 U	260 U	260 U	510 U	260 U	**38,000**	260 U	**710**	260 U	260 U	**3,500**	260 U	**920**	260 U
SP-102	11/28/2007	ppbv	300 U	300 U	300 U	300 U	300 U	300 U	300 UJ	300 U	300 U	300 U	300 U	300 U	300 U	300 U	**4,400**	300 U	300 U	300 U	300 U	590 U	300 U	**45,000**	300 U	**1,300**	300 U	300 U	**4,300**	300 U	**1,100**	300 U
SP-102	11/29/2007	ppbv	250 U	250 U	250 U	250 U	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	250 U	**280 J**	**4,500**	250 U	250 U	250 U	250 U	490 U	250 U	**45,000**	250 U	**1,300**	250 U	250 U	**5,400**	250 U	**1,200**	250 U
SP-102	11/30/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	**280 J**	**4,300**	240 U	240 U	240 U	240 U	470 U	240 U	**46,000**	240 U	**1,800 J**	240 U	240 U	**5,100**	240 U	**1,300**	240 U
SP-102	12/3/2007	ppbv	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	230 U	**480**	**3,100**	230 U	230 U	230 U	230 U	460 U	230 U	**28,000**	230 U	**1,300 J**	230 U	230 U	**3,300**	230 U	**5,100**	230 U
SP-102	12/4/2007	ppbv	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U	**3,800**	350 U	350 U	350 U	350 U	710 U	350 U	**37,000**	350 U	**2,200 J**	350 U	350 U	**4,200**	350 U	**1,400**	350 U
SP-102	12/5/2007	ppbv	220 U	220 U	220 U	220 U	220 U	220 U	220 UJ	220 U	220 U	220 U	220 U	220 U	220 U	**360 J**	**4,000**	220 U	220 U	220 U	220 U	450 U	220 U	**42,000**	220 U	220 U	220 U	220 U	**3,200**	220 U	**1,700**	220 U
SP-102	12/6/2007	ppbv	220 U	220 U	220 U	220 U	220 U	220 U	220 UJ	220 U	220 U	220 U	220 U	220 U	220 U	**370 J**	**5,000**	220 U	220 U	220 U	220 U	450 U	220 U	**55,000**	220 U	**2,100**	220 U	220 U	**5,500**	220 U	**1,500**	220 U
SP-102	12/7/2007	ppbv	210 U	210 U	210 U	210 U	210 U	210 U	210 UJ	210 U	210 U	210 U	210 U	210 U	210 U	**320 J**	**5,100**	210 U	210 U	210 U	210 U	410 U	210 U	**54,000**	210 U	**1,900**	210 U	210 U	**6,500**	210 U	**1,700**	210 U
SP-102	12/10/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	240 UJ	240 U	240 U	240 U	240 U	240 U	240 U	**420 J**	**2,800**	240 U	240 U	240 U	240 U	480 U	240 U	**25,000**	240 U	**1,100**	240 U	240 U	**3,900**	240 U	**4,300**	240 U
SP-102	12/11/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	240 UJ	240 U	240 U	240 U	240 U	240 U	240 U	**290 J**	**3,800**	240 U	240 U	240 U	240 U	480 U	240 U	**37,000**	240 U	**1,100**	240 U	240 U	**4,800**	240 U	**2,000**	240 U
SP-102	12/12/2007	ppbv	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	240 U	**320 J**	**4,100**	240 U	240 U	240 U	240 U	470 U	240 U	**40,000**	240 U	**1,200**	240 U	240 U	**4,100**	240 U	**2,000**	240 U
SP-102	12/13/2007	ppbv	300 U	300 U	300 UJ	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	**350 J**	**3,700**	300 U	300 U	300 U	300 U	600 U	300 U	**32,000**	300 U	**1,000**	300 U	300 U	**2,600**	300 U	**1,700**	300 U
SP-102	12/14/2007	ppbv	260 U	260 U	260 UJ	260 U	260 U	260 U	260 UJ	260 U	260 U	260 U	260 U	260 U	260 U	**330 J**	**3,000**	260 U	260 U	260 UJ	260 U	510 U	260 U	**24,000**	260 U	**890**	260 U	260 U	**2,300**	260 U	**2,500**	260 U
SP-102	12/17/2007	ppbv	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**300 J**	**2,900**	250 U	250 U	250 UJ	250 U	500 U	250 U	**23,000**	250 U	250 U	250 U	250 U	**3,300**	250 U	**2,600**	250 U
SP-102	12/19/2007	ppbv	280 U	280 U	280 UJ	280 U	280 U	280 U	280 U	280 U	280 U	280 U	280 U	280 U	280 U	280 U	**2,700**	280 U	280 U	280 UJ	280 U	560 U	280 U	**34,000**	280 U	**630**	280 U	280 U	**3,400**	280 U	**1,300**	280 U
SP-102	12/20/2007	ppbv	240 U	240 U	240 UJ	240 U	240 U	240 UJ	240 UJ	**390 J**	240 U	240 U	240 U	240 U	240 U	**340 J**	**3,300**	240 U	240 U	240 UJ	240 U	480 U	240 U	**28,000**	240 U	**880**	240 U	240 U	**3,700**	240 U	**1,800**	240 U
SP-102	12/21/2007	ppbv	230 U	230 U	230 UJ	230 U	230 U	230 UJ	230 UJ	230 U	230 U	230 U	230 U	230 U	230 U	**290 J**	**3,300**	230 U	230 U	230 UJ	230 U	460 U	230 U	**26,000**	230 U	**780**	230 U	230 U	**3,900**	230 U	**1,900**	230 U
SP-102	12/26/2007	ppbv	220 U	220 U	220 UJ	220 U	220 U	220 UJ	220 UJ	220 U	220 U	220 U	220 U	220 U	220 U	**230 J**	**1,600**	220 U	220 U	220 UJ	220 U	440 U	220 U	**12,000**	220 U	**930**	220 U	220 U	**2,300**	220 U	**1,400**	220 U
SP-102	12/27/2007	ppbv	240 U	240 U	240 UJ	240 U	240 U	240 UJ	240 UJ	240 U	240 U	240 U	240 U	240 U	240 U	240 U	**2,000**	240 U	240 U	240 UJ	240 U	480 U	240 U	**14,000**	240 U	**900**	240 U	240 U	**2,600**	240 U	**1,800**	240 U
SP-102	12/28/2007	ppbv	230 U	230 U	230 U	230 U	230 U	230 U	230 UJ	230 U	230 U	230 U	230 U	230 U	230 U	230 U	**1,700**	230 U	230 U	230 UJ	230 U	470 U	230 U	**15,000**	230 U	**930**	230 U	230 U	**2,500**	230 U	**1,600**	230 U
SP-102	12/31/2007	ppbv	200 U	200 U	200 UJ	200 U	200 U	200 U	200 UJ	200 U	200 U	200 U	200 U	200 U	200 U	200 U	**1,400**	200 U	200 U	200 UJ	200 U	400 U	200 U	**12,000**	200 U	**750**	200 U	200 U	**1,500**	200 U	**960**	200 U

Notes:
Bolded results indicate positive detections.
Analyses were performed by an EPA Region 9 laboratory using EPA Method TO-15 .
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete lab reports, see Appendix 4.
Daily samples were collected from SP-102 except for on weekends, holidays, and when the vapor treatment system was down.
* Freon 113 is reported as 1,1,2-Trichloro-1,2,2-trifluoroethane in the laboratory reports in Appendix 4.
U - not detected above the stated reporting limit; J - quantitative estimate; UJ - not detected at estimated reporting limit
"--" - not available
ppbv - part per billion by volume

Table 3.7
TIC Analytical Results in Vapor Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	TIC Detected	Minimum		Maximum		Average
			Concentration (ppbv)	Date	Concentration (ppbv)	Date	Concentration (ppbv)
SP-102	Influent to FTO	Butane	4,300 J	5/30/2007	6,300 J	6/18/2007	5,300 J
		Dimethylcyclohexane	360 J	8/15/2007	3,100 J	5/15/2007	985 J
		Dimethylhexane isomers	2,100 J	12/7/2007	9,100 J	9/12/2007	4,400 J
		Dimethylbutanes	1,260 J	5/22/2007	167,000 J	5/17/2007	38,301 J
		Dimethylpentane	680 J	9/4/2007	38,000 J	5/17/2007	7,369 J
		Isobutane	1,300 J	11/29/2007	8,100 J	6/18/2007	5,200 J
		Methylheptane isomers	1,500 J	8/20/2007	2,000 J	10/26/2007	1,800 J
		Methylbutanes	910 J	8/10/2007	6,400 J	6/7/2007	3,776 J
		Methylcyclopentane	430 J	5/22/2007	70,000 J	8/6/2007	23,626 J
		Methylhexane	150 J	5/22/2007	15,300 J	9/10/2007	4,264 J
		Methylpentane	460 J	5/22/2007	520,000 J	8/6/2007	164,236 J
		n-Octane	760 J	9/7/2007	1,600 J	9/11/2007	1,180 J
		n-Pentane	1,000 J	11/19/2007 11/30/2007	3,700 J	8/7/2007	1,825 J
		Tetrahydromethylfuran	26,000 J	5/29/2007	53,000 J	5/30/2007	42,333 J
		Trimethylbutane	1,800 J	9/11/2007 11/14/2007	2,000 J	8/14/2007 11/20/2007	1,900 J
		Unknown hydrocarbons	1,300 J	12/13/2007	1,110,000 J	5/14/2007	371,367 J
SP-104	Pre-GAC	Acetophenone	9 J	11/20/2007	15 J	9/25/2007	12 J
		Dimethylbutanes	16 J	10/8/2007	80 J	10/1/2007	46 J
		Dimethyldecane	13 J	9/25/2007	24 J	9/5/2007	18 J
		Dimethyloctane	8 J	12/4/2007	33 J	12/27/2007	20 J
		Methylcyclopentane	6 J	11/20/2007	55 J	8/14/2007	35 J
		Methylpentane	16 J	12/20/2007	410 J	8/14/2007	166 J
		Total hydrocarbons	97 J	11/15/2007	280 J	10/23/2007	187 J
		Unknown hydrocarbons	5 J	9/25/2007	25 J	10/15/2007	14 J
SP-106	Post-Primary GAC	1-Nonanal	8 J	7/31/2007	16 J	8/7/2007	12 J
		1-Pentene	22 J	7/11/2007 9/18/2007	160 J	7/17/2007	68 J
		Acetaldehyde	10 J	10/29/2008	15 J	11/15/2007	12 J
		Acetophenone	7 J	12/4/2007	15 J	9/25/2007	10.6 J
		Dimethylbutanes	114 J	12/27/2007	840 J	12/11/2007	379 J
		Isobutane	5 J	7/11/2007	28 J	7/17/2007	17 J
		Methylbutanes	6 J	7/25/2007	40 J	7/31/2007	23.6 J
		Methylcyclopentane	76 J	10/29/2007	260 J	12/11/2007 12/27/2007	160 J
		Methylethylbenzene	7 J	11/20/2007	12 J	7/25/2007 7/27/2007	10 J
		Methylpentane	17 J	7/17/2007	6,000 J	12/11/2007 12/27/2007	852 J
		n-Pentane	10 J	10/29/2007	24 J	11/27/2007	18.4 J
		Total hydrocarbons	54 J	7/25/2007	640 J	10/1/2007	194 J
		Unknown hydrocarbons	10 J	10/23/2007	290 J	10/1/2007	58 J
SP-108	Post-Secondary GAC	Acetophenone	6 J	12/4/2007	16 J	9/25/2007	10 J
		Cyclopentane	6 J	10/23/2007	89 J	12/4/2007	33 J
		Dimethylundecane	33 J	10/8/2007	39 J	7/11/2007	36 J
		Dimethylbutanes	22 J	12/11/2007	467 J	12/20/2007	155 J
		Isobutane	4 J	7/25/2007	16 J	5/31/2007	9.7 J
		Methylbutanes	8 J	11/7/2007	110 J	12/11/2007	51 J
		Methylcyclopentane	10 J	9/18/2007	190 J	12/20/2007	20.5 J
		Methylethylbenzene	7 J	11/27/2007	25 J	7/31/2007	14.5 J
		Methylpentane	6 UJ	10/23/2007	257 J	5/31/2007	95 J
		n-Pentane	12 J	11/7/2007	31 J	12/20/2007	15 J
		Total hydrocarbons	64 J	7/25/2007	590 J	10/1/2007	192 J
		Unknown hydrocarbons	7 J	11/27/2007	229 J	10/1/2007	34 J
SP-109	Final Effluent	1-Pentene	9 J	10/29/2007	34 J	11/7/2007	22 J
		Acetophenone	6 J	10/29/2007	17 J	7/25/2007	10 J
		Butane	6 J	9/18/2007	7 J	7/25/2007	6 J
		Cyclohexanone	26 J	10/15/2007	29 J	8/7/2007	28 J

Table 3.7
TIC Analytical Results in Vapor Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	TIC Detected	Minimum		Maximum		Average
			Concentration (ppbv)	Date	Concentration (ppbv)	Date	Concentration (ppbv)
SP-109 Continued	Final Effluent	Cyclopentane	22 J	11/15/07 12/20/07	48 J	11/27/2007	31 J
		Dimethyloctane	35 J	12/27/2007	43 J	7/12/2007	39 J
		Dimethylpentane	53 J	10/1/2007	430 J	11/20/2007	242 J
		Dimethylbutanes	9 J	11/27/2007	940 J	11/20/2007	201 J
		Isobutane	8 J	7/12/2007	14 J	7/25/2007	11 J
		Methylbutanes	50 J	12/20/2007	200 J	12/11/2007	109 J
		Methylethylbenzene	8 J	10/29/2007	32 J	7/25/2007	22 J
		Methylcyclopentane	11 J	11/27/2007	760 J	11/20/2007	163 J
		Methylhexane	6 J	10/8/2007	270 J	11/20/2007	80 J
		Methylpentane	7 J	9/18/2007	5,900 J	11/20/2007	799 J
		n-Pentane	16 J	12/27/2007	97 J	11/20/2007	46 J
		Total hydrocarbons	66 J	10/8/2007	430 J	10/23/2007	182 J
		Unknown hydrocarbons	8 J	9/25/2007	66 J	10/8/2007	34 J
SP-111	DPE-A Manifold	Dimethylcyclohexane	300 J	10/1/2007	2,400 J	8/7/2007	1,068 J
		Dimethylbutanes	1,930 J	10/1/2007	125,000 J	7/31/2007	27,177 J
		Dimethylpentane	710 J	10/8/2007	22,400 J	7/31/2007	5,101 J
		Methylheptane isomers	640 J	9/5/2007	1,500 J	8/7/2007	1,070 J
		Methylbutanes	10 J	10/23/2007	7,800 J	7/31/2007	3,905 J
		Methylcyclopentane	9 J	9/25/2007	100,000 J	7/31/2007	17,992 J
		Methylhexane	350 J	10/8/2007	16,000 J	7/31/2007	3,346 J
		Methylpentane	5 J	12/11/2007	790,000 J	7/31/2007	165,492 J
		n-Octane	60 J	10/8/2007	640 J	11/20/2007	350 J
		n-Pentane	130 J	10/8/2007	2,300 J	10/15/2007	853 J
		Unknown hydrocarbons	8 J	10/23/2007	47 J	9/25/2007	27 J
SP-112	DPE-B Manifold	Butane	8 J	9/25/2007	1,100 J	11/20/2007	529 J
		Dimethylbutanes	4 J	10/23/2007	2,240 J	7/31/2007	528 J
		Isobutane	120 J	12/4/2007	4,600 J	7/17/2007	1,518 J
		Methylbutanes	18 J	10/23/2007	2,100 J	7/17/2007	488 J
		Methylcyclohexane	89 J	12/27/2007	260 J	7/25/2007	172 J
		Methylcyclopentane	7 J	10/23/2007	1,100 J	7/11/2007	344 J
		Methylhexane	6 J	10/23/2007	180 J	7/17/2007	87 J
		Methylpentane	8 J	9/25/2007	10,500 J	7/11/2007	2,080 J
		n-Pentane	6 J	10/23/2007	280 J	7/31/2007	134 J
		Unknown hydrocarbons	8J	10/23/2007	47 J	9/25/2007	27 J
SP-113	DPE-D Manifold	Butane	300 J	8/7/2007	20,000 J	6/19/2007	6,091 J
		Dimethylbutanes	37 J	9/25/2007	6,400 J	7/17/2007	1,913 J
		Isobutane	400 J	8/7/2007	27,000 J	7/11/2007	11,592 J
		Methylbutanes	11 J	10/23/2007	16,000 J	7/17/2007	5,174 J
		Methylcyclohexane	150 J	11/7/2007	630 J	12/27/2007	427 J
		Methylcyclopentane	7 J	10/23/2007	5,700 J	7/17/2007	1,203 J
		Methylhexane	35 J	9/25/2007	1,000 J	7/17/2007	411 J
		Methylpentane	35 J	10/23/2007	55,000 J	7/17/2007	11,195 J
		n-Pentane	340 J	8/7/2007	7,800 J	11/27/2007	2,050 J
		Trimethylcyclohexanone	340 J	9/18/2007	2,400 J	8/7/2007	952 J
SP-114	DPE-C Manifold	Dimethylbutanes	22 J	11/15/2007	3,900 J	5/31/2007	977 J
		Dimethylpentane	8 J	11/15/2007	1,000 J	5/31/2007	504 J
		Methylbutanes	13 J	11/7/2007	340 J	11/27/2007	184 J
		Methylcyclopentane	4 J	8/14/2007	430 J	5/31/07 6/19/07	160 J
		Methylhexane	12 UJ	11/20/2007	21 J	11/15/2007	17 J
		Methylpentane	26 J	8/14/2007	7,700 J	5/31/2007	1,644 J
		n-Pentane	10 J	11/7/2007	160 J	11/27/2007	85 J
		Trimethylcyclohexanone	6 J	12/11/07 12/27/07	69 J	11/27/2007	44 J
		Unknown hydrocarbons	8 J	11/7/2007	21 J	11/27/2007	14 J

Table 3.7
TIC Analytical Results in Vapor Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	TIC Detected	Minimum		Maximum		Average
			Concentration (ppbv)	Date	Concentration (ppbv)	Date	Concentration (ppbv)
SP-115	VE-3 Manifold	Butane	5 J	10/23/2007	140 J	9/5/2007	73 J
		Dimethylbutanes	34 J	8/14/2007	88,000 J	8/7/2007	19,077 J
		Dimethylpentane	1,100 J	12/27/2007	18,900 J	9/18/2007	8,164 J
		Methylbutanes	14 J	10/23/2007	8,100 J	8/7/2007	2,453 J
		Methylcyclopentane	17 J	12/11/2007	97,000 J	8/7/2007	24,227 J
		Methylhexane	2,300 J	12/27/2007	13,000 J	8/7/2007	5,669 J
		Methylpentane	53 J	12/11/2007	750,000 J	8/7/2007	161,302 J
		n-Pentane	520 J	9/25/2007	7,200 J	8/7/2007	2,365 J
		Unknown hydrocarbons	6.2 J	10/23/2007	3,900 J	10/8/2007	1,803 J
SP-116	VE-4 Manifold	Methylcyclopentane	13 J	10/23/2007	1,6000 J	10/29/2007	5,365 J
		Methylpentane	75 J	10/23/2007	280 J	9/18/2007	178 J
SP-801	ERH Zone 801	Acetaldehyde	73 J	12/27/2007	120 J	12/20/2007	97 J
		Butane	77 J	12/20/2007	340 J	11/8/2007	176 J
		Dimethylbutanes	66 J	12/11/2007	440 J	10/1/2007	166 J
		Ethylcyclopropane	30 J	10/15/2007	60 J	9/27/2007	45 J
		Isobutane	27 J	10/15/2007	500 J	11/8/2007	177 J
		Methylbutanes	31 J	10/15/2007	190 J	11/8/2007	97 J
		Methylcyclopentane	29 J	10/15/2007	360 J	10/1/2007	114 J
		Methylpentane	260 J	10/1/2007	2,900 J	12/27/2007	843 J
		n-Pentane	37 J	10/15/2007	99 J	11/8/2007	62 J
		Unknown hydrocarbons	54 J	12/4/2007	62 J	12/11/2007	58 J
SP-802	ERH Zone 802	Dimethylbutanes	1700 J	12/20/2007	23,000 J	9/27/2007	8,544 J
		Dimethylpentane	2,400 J	11/27/2007	9,000 J	9/27/2007	5,340 J
		Methylcyclopentane	2,800 J	10/8/2007	24,000 J	9/27/2007	11,173 J
		Methylhexane	1,100 J	10/8/2007 10/15/2007	5,100 J	9/27/2007	2,538 J
		Methylpentane	4,200 J	11/8/2007	157,000 J	9/27/2007	52,854 J
SP-803	ERH Zone 803	Dimethylcyclohexane	2,090 J	10/8/2007	4,400 J	10/15/2007	3,348 J
		Dimethylbutanes	11,000 J	12/20/2007	168,000 J	9/27/2007	52,075 J
		Dimethylpentane	7,000 J	12/20/2007	78,000 J	9/27/2007	26,833 J
		Methylheptane isomers	600 J	10/8/2007	5,300 J	11/15/2007	2,950 J
		Methylcyclopentane	21,000 J	12/20/2007	200,000 J	9/27/2007	76,000 J
		Methylpentane	490 J	10/8/2007	1,130,000 J	9/27/2007	408,345 J
		n-Octane	1,100 J	10/8/2007	6,300 J	10/23/2007	4,125 J
		n-Pentane	1,900 J	11/15/2007	11,000 J	9/27/2007	5,088 J
		Unknown hydrocarbons	1,900 J	10/23/2007	78,000 J	10/1/2007	28,966 J
SP-804	ERH Zone 804	Acetaldehyde	90 J	11/20/2007	190 J	12/20/2007	135 J
		Butane	60 J	10/1/2007	86 J	11/8/2007	71 J
		Cyclohexanone	47 J	10/8/2007	590 J	12/20/2007	243 J
		Dimethylbutanes	68 J	11/20/2007	16,900 J	9/27/2007	3,096 J
		Dimethylpentane	240 J	10/8/2007	6,600 J	9/27/2007	3,420 J
		Methylcyclopentane	63 J	11/8/2007	20,000 J	9/27/2007	2,297 J
		Methylhexane	72 J	12/11/2007	3,700 J	9/27/2007	1,401 J
		Methylpentane	220 J	11/27/2007	131,000 J	9/27/2007	12,977 J
		n-Pentane	120 J	10/8/2007	1,200 J	9/27/2007	660 J
		Unknown hydrocarbons	58 J	11/8/2007	250 J	10/30/2007	125 J
SP-805	ERH Zone 805	Dimethylbutanes	110 J	10/8/2007	23,800 J	11/15/2007	8322 J
		Dimethylpentane	5,400 J	12/4/2007	14,200 J	11/15/2007	10,275 J
		Methylcyclopentane	110 J	10/8/2007	34,000 J	11/15/2007	13,842 J
		Methylhexane	1,900 J	12/27/2007	9,100 J	11/15/2007	5,267 J
		Methylpentane	760 J	10/8/2007	202,000 J	11/15/2007	66,576 J
		n-Pentane	48 J	11/8/2007	79 J	10/23/2007	67 J
		Unknown hydrocarbons	68 J	10/23/2007	2,500 J	11/15/2007	924 J

Notes:

Analyses were performed by EPA Region 9 laboratory using EPA Method TO-15 .

Averages were calculated for positive detections of TICs that were detected at least 2 times in samples collected during 2007.

For a complete list of TIC detections, see Table A2.2 in Appendix 2.

ERH - electrical resistance heating; FTO - flameless thermal oxidizer; GAC - granular activated carbon; TICs - tentatively identified compounds

J - estimated detection

ppbv - part per billion by volume

Table 3.8
Light Hydrocarbon Analytical Results for the Influent to the Vapor Treatment System
Pemaco Superfund Site, Maywood, CA

Station ID	Date	Analyte: Units	PID[1]	Butane	Ethane	Ethene	Methane	n-Hexane	n-Pentane	Propane
SP-102	6/20/2007	ppmv	88.6	**9.5**	**100**	1 U	**5,200**	**320**	**9.7**	**22**
SP-102	7/11/2007	ppmv	44.3	**4.6**	**51**	1 U	**2,600**	**350**	**9.8**	**11**
SP-102	7/17/2007	ppmv	61.4	**7.3**	**78**	1 U	**3,800**	**280**	**10**	**17**
SP-102	7/25/2007	ppmv	--	**3.7**	**37**	1 U	**2,000**	**250**	**11**	**8.6**
SP-102	7/31/2007	ppmv	156	1 U	**5.9**	1 U	**420**	**130**	**1.8**	**1.3**
SP-102	8/7/2007	ppmv	194	**1.5**	**14**	1 U	**860**	**820**	**19**	**3.7**
SP-102	9/5/2007	ppmv	262	**2**	**23**	1 U	**1,100**	**260**	**5.3**	**5.7**
SP-102	9/11/2007	ppmv	1,281	**1.2**	**12**	1 U	**670**	**730**	**13**	**3.1**
SP-102	9/18/2007	ppmv	970	**1.4**	**15**	1 U	**890**	**570**	**9.5**	**3.7**
SP-102	9/25/2007	ppmv	340	**1.3**	**14**	1 U	**900**	**450**	**7.3**	**3.3**
SP-102	10/1/2007	ppmv	85	1 U	1 U	1 U	**120**	**170**	**2.5**	1 U
SP-102	10/8/2007	ppmv	183.6	1 U	1 U	1 U	**290**	**370**	**5.5**	1 U
SP-102	10/15/2007	ppmv	160	1 U	1 U	1 U	**240**	**370**	**5.4**	1 U
SP-102	10/23/2007	ppmv	232	**2.1**	**19**	1 U	**1,200**	**730**	**17**	**4.8**
SP-102	10/29/2007	ppmv	446	1 U	**6.3**	1 U	**440**	**130**	**2**	**1.4**
SP-102	11/7/2007	ppmv	375	**1.9**	**21**	1 U	**1,200**	**190**	**3.2**	**5.1**
SP-102	11/15/2007	ppmv	168	1 U	1 U	1 U	**150**	**220**	**3.2**	1 U
SP-102	11/20/2007	ppmv	386	1 U	**3.7**	1 U	**290**	**220**	**3.5**	1 U
SP-102	11/27/2007	ppmv	308	**1.7**	**19**	1 U	**1,000**	**170**	**3**	**4.7**
SP-102	12/4/2007	ppmv	274	**3.7**	**41**	1 U	**2,200**	**170**	**3.7**	**9.9**
SP-102	12/11/2007	ppmv	280	**1.2**	**11**	1 U	**620**	**150**	**2.7**	**3**
SP-102	12/20/2007	ppmv	487	**1.6**	**12**	1 U	**700**	**180**	**3.6**	**3.5**
SP-102	12/27/2007	ppmv	33.1	**1.7**	**15**	1 U	**760**	**100**	**2.4**	**4.2**

Notes:

1 - PID was calibrated for 100 ppm Isobutylene gas before each measurement.

Analyses were performed by Calscience Environmental Laboratories, Inc. using EPA Method TO-3(M) .

Bolded results indicate positive detections.

PID - photoionization detector

U - not detected above the stated reporting limit

"--" - not available

ppmv - part per million by volume

Table 3.9
VOC Analytical Results for the Vapor Treatment System Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Units	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	Freon 113*	Hexachlorobutadiene	Isopropanol	*m,p*-Xylene	Methylene chloride	n-Hexane	*o*-Xylene	Propylene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Maximum Emission Limit (ppbv):				74	133,700	--	NL	--	8.4	--	NL	19	116,100	--	--	--	NL	--	124,800	--	NL	--	124,800	--	--	124,800	--	24	--	143,900	NL	110	31
SP-106	Post-Primary GAC	5/31/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	--	**39**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	**3.8**	1.3 U	**4.6**	1.3 U	--	**5.8**	1.3 U	**3.5**	1.3 U
SP-108	Post-Secondary GAC	5/31/2007	ppbv	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 U	1.6 U	--	**7.4**	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	**12**	1.6 U	1.6 U	1.6 UJ	1.6 U	3.2 U	1.6 U	**54**	1.6 U	**37**	1.6 U	--	**15**	1.6 U	**8.3**	1.6 U
SP-106	Post-Primary GAC	6/14/2007	ppbv	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	**34**	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	3.2 U	1.6 U	1.6 U	1.6 U	4.5 UJ	1.6 U	--	**5.2**	1.6 U	1.6 U	1.6 U
SP-108	Post-Secondary GAC	6/14/2007	ppbv	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	--	**10**	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	14 UJ	1.6 U	1.6 U	1.6 U	1.6 U	3.3 U	1.6 U	**91**	1.6 U	**16**	1.6 U	--	**2.8 J**	1.6 U	**12**	1.6 U
SP-106	Post-Primary GAC	7/11/2007	ppbv	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	--	**21 J**	0.5 U	**0.5 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	**1.5**	0.5 U	--	**1.1**	0.5 U	0.5 U	0.5 U
SP-108	Post-Secondary GAC	7/11/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	--	**8**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.7 U	1.4 U	1.4 U	1.4 U	**5.4**	1.4 U	--	1.4 U	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	7/12/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	**15**	1.3 U	**1.9 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	1.3 U	1.3 U	**2.5 J**	1.3 U	--	1.3 U	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	7/17/2007	ppbv	2 U	**2.2 J**	2 U	2 U	2 U	2 UJ	--	**37**	2 U	2 U	2 U	2 U	2 U	**2 J**	2 U	2 U	2 U	2 U	2 U	4 U	2 U	**5**	2 U	**10**	2 U	--	**6.7**	2 U	**2.7 J**	2 U
SP-108	Post-Secondary GAC	7/17/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	--	**14**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1.4 U	1.4 U	**3.5**	1.4 U	--	**1.8 J**	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	7/17/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	--	**7.6**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1.4 U	1.4 U	**4.4**	1.4 U	--	1.4 U	1.4 U	1.4 U	1.4 U
SP-106	Post-Primary GAC	7/25/2007	ppbv	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 UJ	--	**27 J**	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	**0.7 J**	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	1.3 U	0.6 U	0.6 U	0.6 U	**1 J**	0.6 U	--	**1.6**	0.6 U	0.6 U	0.6 U
SP-108	Post-Secondary GAC	7/25/2007	ppbv	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 UJ	--	**11**	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	1.3 U	0.6 U	0.6 U	0.6 U	**2.2**	0.6 U	--	**0.6 J**	0.6 U	0.6 U	0.6 U
SP-109	Final Effluent	7/25/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	--	**2.6**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	1.3 U	1.3 U	**6.9**	1.3 U	--	1.3 U	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	7/31/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	**26 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	3.8 UJ	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	3.4 UJ	1.3 U	**1.5 J**	1.3 U	**4.2**	4.8 UJ	1.3 U	2.2 UJ	1.3 U
SP-108	Post-Secondary GAC	7/31/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	--	**20 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	3 UJ	1.4 U	1.4 U	1.4 U	**2.4 J**	3.2 UJ	1.4 U	2.3 UJ	1.4 U
SP-109	Final Effluent	7/31/2007	ppbv	1.4 U	**3.3**	1.4 U	1.4 U	1.4 U	1.4 U	--	4.3 UJ	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	**40**	160 UJ	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1,800 UJ	1.4 U	**18**	1.4 U	**2.6 J**	130 UJ	**1.7 J**	**360**	2.9 UJ
SP-106	Post-Primary GAC	8/7/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	--	**31**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**5.1**	**9.7**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**1.8 J**	1.3 U	**2.1 J**	1.3 U	**1,300 J**	**2.2 J**	1.3 U	**12**	1.3 U
SP-108	Post-Secondary GAC	8/7/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	--	**100 J**	1.3 U	1.3 U	1.3 U	**12**	**4.8**	**4.5**	**70 J**	1.3 U	1.3 U	1.3 U	**3.5**	2.6 U	1.3 U	**34**	1.3 U	**5.1**	1.3 U	**11,000 J**	**4.6**	1.3 U	**81**	**2.6**
SP-109	Final Effluent	8/7/2007	ppbv	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	--	**15**	1.4 U	1.4 U	1.4 U	**1.9 J**	1.4 U	1.4 U	**13**	1.4 U	1.4 U	1.4 U	1.4 U	2.7 U	1.4 U	**5**	1.4 U	**1.5 J**	1.4 U	**4,100**	1.4 U	1.4 U	**27**	1.4 U
SP-104	Post-FTO	8/14/2007	ppbv	4 U	4 U	4 U	4 U	4 U	4 U	--	**17 UJ**	4 U	4 U	4 U	4 U	4 U	4 U	**14**	4 U	4 U	4 U	4 U	8 U	4 U	**180**	4 U	4 U	4 U	**44**	**14 UJ**	4 U	**8.3 J**	4 U
SP-106	Post-Primary GAC	8/14/2007	ppbv	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	--	**16 UJ**	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	**10**	3.7 U	3.7 U	3.7 U	3.7 U	7.5 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	**59**	3.7 U	3.7 U	**5.4 J**	3.7 U
SP-108	Post-Secondary GAC	8/14/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	--	**18 UJ**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.9 U	1.4 U	1.4 U	1.4 U	**2 J**	1.4 U	**47**	**2.3 UJ**	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	8/14/2007	ppbv	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	--	**11 UJ**	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	9.2 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	**130**	4.6 U	4.6 U	4.6 U	4.6 U
SP-104	Post-FTO	9/5/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**5.5**	**7.3**	1.4 U	**2.2 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**6.1**	1.4 U	1.4 U	1.4 U	1.4 U
SP-106	Post-Primary GAC	9/5/2007	ppbv	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	**7.3 J**	**18**	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	7.5 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	**9**	**8.3**	3.8 U	3.8 U	3.8 U
SP-108	Post-Secondary GAC	9/5/2007	ppbv	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	**4.3 J**	**5.6 J**	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	7.8 U	3.9 U	**43**	3.9 U	3.9 U	3.9 U	**17**	**10**	3.9 U	3.9 U	3.9 U
SP-109	Final Effluent	9/5/2007	ppbv	14 U	14 U	14 U	14 U	14 U	14 UJ	14 U	**18 J**	14 U	14 U	14 U	14 U	14 U	14 U	**24 J**	14 U	14 U	14 U	14 U	27 U	14 U	**310**	14 U	14 U	14 U	14 U	**90**	14 U	14 U	14 U
SP-104	Post-FTO	9/11/2007	ppbv	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	**2 J**	**5.7**	1.5 U	1.5 U	1.5 U	**1.8 J**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3 U	1.5 U	**14**	1.5 U	1.5 U	1.5 U	**2 J**	**6.1**	1.5 U	1.5 U	1.5 U
SP-106	Post-Primary GAC	9/11/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**1.8 J**	**28**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**1.8 J**	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	**2 J**	**23**	1.4 U	**1.9 J**	1.4 U	**4.1**	**11**	1.4 U	**1.8 J**	1.4 U
SP-108	Post-Secondary GAC	9/11/2007	ppbv	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	**4.2 J**	**30**	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	5.2 U	2.6 U	**3 J**	2.6 U	2.6 U	2.6 U	2.6 U	**8.2**	2.6 U	2.6 U	2.6 U
SP-109	Final Effluent	9/11/2007	ppbv	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	28 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U
SP-104	Post-FTO	9/18/2007	ppbv	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	**5 J**	**7.6 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	**5.9**	1.4 U	**2.2 J**	1.4 U	**14**	**3.2**	1.4 U	1.4 U	1.4 U
SP-106	Post-Primary GAC	9/18/2007	ppbv	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	**12 J**	**2.1 J**	1.2 U	**2.3 J**	1.2 U	**1.4 J**	1.2 U	**5.3**	**41**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**5.6**	1.2 U	1.2 U	1.2 U	--	**22**	1.2 U	**6.8**	1.2 U
SP-108	Post-Secondary GAC	9/18/2007	ppbv	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	**3.4 J**	**3.6 J**	1.5 U	**8**	1.5 U	1.5 U	1.5 U	1.5 U	**3.6**	1.5 U	1.5 U	1.5 U	1.5 U	3.1 U	1.5 U	**20**	1.5 U	**2.2 J**	1.5 U	**12**	**49**	1.5 U	**2.3 J**	1.5 U
SP-109	Final Effluent	9/18/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 UJ	**4.5 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.7 U	1.3 U	**6.2**	1.3 U	**2.8**	1.3 U	**14**	**3**	1.3 U	1.3 U	1.3 U
SP-104	Post-FTO	9/25/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 UJ	**5.4**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.5 U	1.3 U	1.3 U	1.3 U	**2.6**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	9/25/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	**6.3 J**	**13**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**2.9**	**25**	1.3 U	1.3 U	1.3 U	1.3 U	2.5 U	1.3 U	1.3 U	1.3 U	**3.1**	1.3 U	**6.2**	1.3 U	1.3 U	1.3 U	1.3 U
SP-108	Post-Secondary GAC	9/25/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	**5 J**	**8.8**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**4.1**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**68**	1.3 U	**1.6 J**	1.3 U	**4.1**	**11**	1.3 U	**1.5 J**	1.3 U
SP-109	Final Effluent	9/25/2007	ppbv	1.3 U	1.3 U	**3**	1.3 U	1.3 U	1.3 U	1.3 UJ	**4.6**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	**4.5**	1.3 U	2.6 U	1.3 U	1.3 U	1.3 U	1.3 UJ	**21**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
SP-104	Post-FTO	10/1/2007	ppbv	3 U	**26**	3 U	3 U	3 U	3 U	**4.9 J**	**19**	3 U	**7.2**	3 U	3 U	3 U	**54**	**15**	3 U	3 U	3 U	3 U	5.9 U	3 U	**200 J**	3 U	**5.4 J**	3 U	**5.3 J**	**29**	3 U	**46**	3 U
SP-106	Post-Primary GAC	10/1/2007	ppbv	**1.5 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**15 J**	**47**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**5.3**	**25**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**7.1**	1.3 U	**2.1 J**	1.3 U	**5.6**	**6.4**	1.3 U	**2.4 J**	1.3 U
SP-108	Post-Secondary GAC	10/1/2007	ppbv	1.4 U	**4.7**	1.4 U	1.4 U	1.4 U	1.4 U	**13 J**	**44**	**1.7 J**	**1.9 J**	1.4 U	1.4 U	1.4 U	**8.8**	**3.9**	1.4 U	1.4 U	1.4 U	1.4 U	2.9 U	1.4 U	**34**	1.4 U	**2.8 J**	**1.9 J**	**2.4 J**	**12**	1.4 U	**7.5**	1.4 U
SP-109	Final Effluent	10/1/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	**15**	**3.7**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**24**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**690**	1.3 U	**1.5 J**	1.3 U	1.3 U	**620**	1.3 U	1.3 U	1.3 U
SP-104	Post-FTO	10/8/2007	ppbv	2.4 U	2.4 U	2.4 UJ	2.4 U	2.4 U	2.4 U	2.4 UJ	**7.7**	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	**9.2**	2.4 U	2.4 U	2.4 U	2.4 U	4.7 U	2.4 U	**81**	2.4 U	2.4 U	2.4 U	**21**	**23**	2.4 U	2.4 U	2.4 U
SP-106	Post-Primary GAC	10/8/2007	ppbv	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	**39 J**	**66**	1.5 U	1.5 U	1.5 U	**1.6 J**	1.5 U	**3.7**	**34**	1.5 U	1.5 U	1.5 U	1.5 U	2.9 U	1.5 U	**13**	1.5 U	**4.7**	1.5 U	**7.5**	**4.4**	1.5 U	1.5 U	1.5 U
SP-108	Post-Secondary GAC	10/8/2007	ppbv	2.9 U	2.9 U	2.9 UJ	2.9 U	2.9 U	2.9 U	**7.6 J**	**21**	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	**3.9 J**	2.9 U	2.9 U	2.9 U	2.9 U	5.8 U	2.9 U	**43**	2.9 U	2.9 U	2.9 U	2.9 U	**6.8**	2.9 U	2.9 U	2.9 U
SP-109	Final Effluent	10/8/2007	ppbv	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 UJ	**6.4**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**11**	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	**110**	1.4 U	**2.2 J**	1.4 U	1.4 U	**15**	1.4 U	**3.3**	1.4 U

Table 3.9
VOC Analytical Results for the Vapor Treatment System Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Units	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	1,4-Dioxane	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	*cis*-1,2-Dichloroethene	Cyclohexane	Ethylbenzene	Freon 113*	Hexachlorobutadiene	Isopropanol	*m,p*-Xylene	Methylene chloride	n-Hexane	*o*-Xylene	Propylene	Tetrachloroethene	Tetrahydrofuran	Toluene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Maximum Emission Limit (ppbv):				74	133,700	--	NL	--	8.4	--	NL	19	116,100	--	--	--	NL	--	124,800	--	NL	--	124,800	--	--	124,800	--	24	--	143,900	NL	110	31
SP-104	Post-FTO	10/15/2007	ppbv	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	**170**	**42**	1.7 U	1.7 U	1.7 U	1.7 U	**1.9 J**	**5.1**	**21**	1.7 U	1.7 U	1.7 U	1.7 U	3.4 U	1.7 U	**210**	1.7 U	**3.5**	1.7 U	**580**	**40**	1.7 U	**17**	1.7 U
SP-106	Post-Primary GAC	10/15/2007	ppbv	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	**36 UJ**	**49**	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ	**2.6 J**	**25**	2.3 U	2.3 U	2.3 U	2.3 U	4.6 U	2.3 U	2.3 U	2.3 U	**4.6 J**	2.3 U	**18 UJ**	2.3 U	2.3 U	2.3 U	2.3 U
SP-108	Post-Secondary GAC	10/15/2007	ppbv	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	**11 UJ**	**16**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	2.9 U	1.5 U	**2.5 J**	1.5 U	**2 J**	1.5 U	**12 UJ**	1.5 U	1.5 U	1.5 U	1.5 U
SP-109	Final Effluent	10/15/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**29 UJ**	**3.8**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.9 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**180 UJ**	1.4 U	1.4 U	1.4 U	1.4 U
SP-104	Post-FTO	10/23/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**8.6**	1.2 U	1.2 U	1.2 U	**1.8 J**	1.2 U	1.2 U	**1.4 J**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**17**	1.2 U	1.2 U	1.2 U	1.2 U	**3.5**	1.2 U	1.2 U	1.2 U
SP-106	Post-Primary GAC	10/23/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**33**	**28**	1.3 U	**1.7 J**	1.3 U	**1.6 J**	1.3 U	**2.7**	**28**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**2 J**	1.3 U	**2.4 J**	1.3 U	**7.9**	**3.4**	1.3 U	1.3 U	1.3 U
SP-108	Post-Secondary GAC	10/23/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**6.7**	**14**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.7 U	1.3 U	**6.3**	1.3 U	1.3 U	1.3 U	1.3 U	**3.1**	1.3 U	1.3 U	1.3 U
SP-109	Final Effluent	10/23/2007	ppbv	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**5.2**	1.1 U	**3**	1.1 U	1.1 U	**1.7 J**	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**1.9 J**	1.1 U	1.1 U	1.1 U
SP-104	Post-FTO	10/29/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	**16**	1.3 U	1.3 U	1.3 U	**2 J**	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.7 U	1.3 U	**3.1**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	10/29/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**22 J**	**24**	1.2 U	1.2 U	1.2 U	**1.4 J**	1.2 UJ	**2.1 J**	**24**	1.2 U	1.2 U	1.2 U	1.2 U	2.5 U	1.2 U	1.2 U	1.2 U	**4.5**	1.2 U	**7.3**	**2.2 J**	1.2 U	1.2 U	1.2 U
SP-108	Post-Secondary GAC	10/29/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**7 J**	**12**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.3 U	1.2 U	1.2 U	1.2 U	**1.3 J**	1.2 U	1.2 U	**3.1**	1.2 U	1.2 U	1.2 U
SP-109	Final Effluent	10/29/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	**2.8**	1.2 U	**2.2 J**	1.2 U	1.2 U	**1.9 J**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.5 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
SP-104	Post-FTO	11/7/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**2.8**	**13**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**4.3 UJ**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**38 UJ**	1.3 U	**1.8 UJ**	1.3 U	1.3 U	**11 UJ**	1.3 U	**1.9 UJ**	1.3 U
SP-106	Post-Primary GAC	11/7/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**5.9**	**11**	1.2 U	1.2 U	1.2 U	**3.1**	1.2 U	**3.4 UJ**	**50 UJ**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**23 UJ**	1.2 U	**1.4 UJ**	1.2 U	**12**	**10 UJ**	1.2 U	**2.6 UJ**	1.2 U
SP-108	Post-Secondary GAC	11/7/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**5.7**	**9.3**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**1.8 J**	2.7 U	1.4 U	**8.1 UJ**	1.4 U	**2.1 UJ**	1.4 U	**2.9 UJ**	**3.3 UJ**	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	11/7/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**3.4**	1.4 U	**1.5 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	**3.5 UJ**	1.4 U	**1.6 UJ**	1.4 U	**2.5 UJ**	**2.5 UJ**	1.4 U	1.4 U	1.4 U
SP-104	Post-FTO	11/15/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 UJ	1.3 UJ	**6.7**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**6.1**	1.3 U	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	11/15/2007	ppbv	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 UJ	**33**	1.2 U	1.2 U	1.2 U	**1.9 J**	1.2 U	**1.5 J**	**27**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**6.8**	1.2 U	**3**	1.2 U	**5.5**	**4.5**	1.2 U	1.2 U	1.2 U
SP-108	Post-Secondary GAC	11/15/2007	ppbv	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 UJ	1.4 UJ	**16**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.9 U	1.4 U	**2.3 J**	1.4 U	**1.6 J**	1.4 U	1.4 U	**3**	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	11/15/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**2.9**	1.4 U	**1.8 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
SP-104	Post-FTO	11/20/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	**15**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**2.4 UJ**	1.3 U	1.3 U	1.3 U	1.3 U	2.7 U	1.3 U	**23 UJ**	1.3 U	**3**	1.3 U	1.3 U	**4.8**	1.3 U	**3.1 UJ**	1.3 U
SP-106	Post-Primary GAC	11/20/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**20 J**	**25**	1.2 U	1.2 U	1.2 U	**2.4 J**	1.2 U	**1.5 J**	**39**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**8.9 UJ**	1.2 U	**2.1 J**	1.2 U	**6.9**	**4.7**	1.2 U	**1.4 UJ**	1.2 U
SP-108	Post-Secondary GAC	11/20/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**6.9 J**	**13**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**1.8 UJ**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	**18 UJ**	1.2 U	**1.8 J**	1.2 U	1.2 U	**7.5**	1.2 U	1.2 U	1.2 U
SP-109	Final Effluent	11/20/2007	ppbv	12 U	12 U	12 U	12 U	12 U	12 U	12 UJ	12 U	**22 J**	12 U	12 U	12 U	12 U	12 U	**300**	12 U	12 U	12 U	12 U	25 U	12 U	**3,100**	12 U	12 U	12 U	12 U	**1,400**	12 U	12 U	12 U
SP-104	Post-FTO	11/27/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**15**	1.3 U	1.3 U	1.3 U	**1.6 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**1.4 J**	1.3 U	1.3 U	1.3 U	1.3 U	**1.6 J**	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	11/27/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**6**	**6.3**	1.4 U	1.4 U	1.4 U	**3.4**	1.4 U	1.4 U	**57**	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**8.6**	**2.6 J**	1.4 U	1.4 U	1.4 U
SP-108	Post-Secondary GAC	11/27/2007	ppbv	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**16**	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	2.8 U	1.4 U	**3.6**	1.4 U	**2.2 J**	1.4 U	1.4 U	**2.7 J**	1.4 U	1.4 U	1.4 U
SP-109	Final Effluent	11/27/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	**3.2**	1.3 U	**1.4 J**	1.3 U	1.3 U	1.3 U	1.3 U	**4.6**	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**62 J**	1.3 U	1.3 U	1.3 U	1.3 U	**12**	1.3 U	1.3 U	1.3 U
SP-104	Post-FTO	12/4/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**3.4**	**15 UJ**	1.3 U	1.3 U	1.3 U	**1.4 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 U	1.3 U	**4.6**	1.3 U	**2.5 UJ**	1.3 U	**5.8**	**3**	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	12/4/2007	ppbv	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**55 J**	**74 J**	1.3 U	1.3 U	1.3 U	**3.2**	1.3 U	1.3 U	**50**	1.3 U	1.3 U	1.3 U	**1.4 J**	2.6 U	1.3 U	1.3 U	1.3 U	**2.3 UJ**	1.3 U	**7**	**2.3 J**	1.3 U	**1.9 J**	1.3 U
SP-108	Post-Secondary GAC	12/4/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**11**	**20**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.3 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**2.2 J**	**2.4**	1.2 U	**1.4 J**	1.2 U
SP-109	Final Effluent	12/4/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**2.8**	**4 UJ**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**11**	1.2 U	1.2 U	1.2 U	1.2 U	2.3 U	1.2 U	**230**	1.2 U	**3 UJ**	1.2 U	**15**	**44**	1.2 U	**1.3 J**	1.2 U
SP-104	Post-FTO	12/11/2007	ppbv	0.9 U	0.9 U	0.9 UJ	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	1.8 U	0.9 U	0.9 U	0.9 U	**1.4 J**	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
SP-106	Post-Primary GAC	12/11/2007	ppbv	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**26**	**36**	1.2 U	1.2 U	1.2 U	**3.4**	1.2 UJ	1.2 U	**47**	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U	1.2 U	JU	1.2 U	**2.3 J**	1.2 U	**8.3**	**2 J**	1.2 U	**1.3 J**	1.2 U
SP-108	Post-Secondary GAC	12/11/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 UJ	**6.1 J**	**24**	1.3 U	1.3 U	1.3 U	**2.6 J**	1.3 U	**3.4**	**1.7 J**	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	1.3 U	1.3 U	1.3 U	**3**	1.3 U	**1.7 J**	1.3 U	**2.1 J**	1.3 U
SP-109	Final Effluent	12/11/2007	ppbv	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	**8.3 J**	2.4 U	2.4 U	2.4 U	**3.8 J**	2.4 UJ	**3.3 J**	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	4.8 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
SP-104	Post-FTO	12/20/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 UJ	1.3 U	**9.3**	1.3 U	1.3 U	1.3 U	**1.6 J**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	9 UJ	1.3 U	1.3 U	**2.5 J**	1.3 U	2.5 UJ	1.3 U	1.3 U	1.3 U
SP-106	Post-Primary GAC	12/20/2007	ppbv	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 UJ	**18**	**17**	1.4 U	1.4 U	1.4 U	**2 J**	1.4 U	**1.9 J**	**30**	1.4 U	1.4 U	1.4 UJ	1.4 U	2.8 U	1.4 U	**150**	1.4 U	**5.2**	1.4 U	**6.6**	**11**	1.4 U	**7.5**	1.4 U
SP-108	Post-Secondary GAC	12/20/2007	ppbv	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 U	**13**	1.2 U	1.2 U	1.2 U	**5.6**	1.2 U	**7.1**	**88**	1.2 U	1.2 U	1.2 UJ	1.2 U	2.5 U	1.2 U	7.2 UJ	1.2 U	**2 J**	1.2 U	**4.3**	**150**	1.2 U	1.4 UJ	1.2 U
SP-109	Final Effluent	12/20/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 UJ	1.3 U	**10**	1.3 U	1.3 U	1.3 U	**4.2**	1.3 U	**5.8**	**71**	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	36 UJ	1.3 U	1.3 U	1.3 U	**5.5**	**20**	1.3 U	2.6 UJ	1.3 U
SP-104	Post-FTO	12/27/2007	ppbv	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 UJ	**14**	1.1 U	1.1 UJ	1.1 U	**2.9**	1.1 U	1.1 U	6.7 UJ	1.1 U	1.1 U	1.1 UJ	1.1 U	2.3 U	1.1 U	**64**	1.1 U	**4.5**	1.1 U	1.1 U	5.7 UJ	1.1 U	**5.3 J**	1.1 U
SP-106	Post-Primary GAC	12/27/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	**14 J**	**10**	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	**11**	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	**42**	1.3 U	**1.8 J**	1.3 U	1.3 U	4.8 UJ	1.3 U	**5.3 J**	1.3 U
SP-108	Post-Secondary GAC	12/27/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 UJ	1.3 U	**3**	**1.4 J**	**4.8**	**47**	1.3 U	1.3 U	1.3 UJ	1.3 U	2.6 U	1.3 U	20 UJ	1.3 U	**1.6 J**	1.3 U	**5.2**	3.9 UJ	1.3 U	**3 J**	1.3 U
SP-109	Final Effluent	12/27/2007	ppbv	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 UJ	**12**	1.3 U	1.3 UJ	1.3 U	**2.9**	1.3 U	**6**	**51**	1.3 U	1.3 U	1.3 UJ	1.3 U	2.7 U	1.3 U	**120**	1.3 U	**6.4**	1.3 U	**5.8**	5.7 UJ	1.3 U	**16 J**	1.3 U

Notes:

Bolded results indicate positive detections.
* Freon 113 is reported as 1,1,2-Trichloro-1,2,2-trifluoroethane in the laboratory reports in Appendix 4.
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete lab reports, see Appendix 4.
Analyses were performed by EPA Region 9 laboratoy using EPA Method TO-15 .
FTO - flameless thermal oxidizer; GAC - granular activated carbon; NL - no limit
U - not detected above the stated reporting limit; J - quantitative estimate; UJ - not detected at estimated reporting limit
ppbv - part per billion by volume

Table 3.10
VOC Analytical Method Comparison for Vapor Samples from SP-104 and SP-109
Pemaco Superfund Site, Maywood, CA

	Station ID:	SP-104																							
	Description:	Post-FTO																							
	Date:	5/31/2007	6/18/2007	7/12/2007	7/25/2007	8/7/2007	8/14/2007	9/5/2007	9/11/2007	9/18/2007	9/25/2007	10/1/2007	10/8/2007	10/15/2007	10/23/2007	10/29/2007	11/7/2007	11/15/2007	11/20/2007	11/27/2007	11/30/2007	12/4/2007	12/11/2007	12/20/2007	12/27/2007
	Units:	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Analyte	**Method**																								
1,1,2,2-Tetrachloroethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15 SIM	**0.03**	0.023 U	**0.064**	0.024 U	0.024 U	**0.057**	0.028 U	0.043 U	0.027 U	0.024 U	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	**0.11**	0.025 U	**0.079**	0.027 U	0.026 U
1,1-Dichloroethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	0.024 U	0.024 U	0.028 U	0.028 U	0.043 U	0.027 U	0.024 U	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	0.025 U	0.03 U	0.027 U	0.026 U
1,1-Dichloroethene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	**26**	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.01 U	0.012 U	0.014 U	0.012 U	0.012 U	0.014 U	0.014 U	0.021 U	0.013 U	0.012 U	0.015 U	0.016 U	0.012 U	0.015 U	0.015 U	0.017 U	0.014 U	0.016 U	--	0.014 U	0.012 U	0.015 U	0.014 U	0.013 U
1,2,4-Trichlorobenzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 UJ	1.3 UJ	3 U	2.4 UJ	1.7 U	1.2 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	--	1.3 U	0.9 UJ	1.3 UJ	1.1 UJ
	TO-15SIM	**0.27**	0.12 U	0.14 U	0.12 U	0.12 U	0.14 U	0.14 U	0.21 U	0.13 U	0.12 U	0.15 U	0.16 U	0.12 U	0.15 U	0.15 U	0.17 U	0.14 U	0.16 U	--	0.14 U	0.12 U	0.15 U	0.14 U	0.13 U
1,2,4-Trimethylbenzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
1,2-Dichlorotetrafluoroethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
1,3,5-Trimethylbenzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
1,4-Dichlorobenzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	0.024 U	0.024 U	0.028 U	0.028 U	0.043 U	0.027 U	0.024 U	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	**0.025**	0.03 U	**0.031**	**0.027**
1,4-Dioxane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 UJ	1.1 U
2-Butanone	TO-15	--	--	--	--	--	--	**5.5**	**2 J**	**5 J**	1.3 UJ	**4.9 J**	2.4 UJ	**170**	1.2 U	1.3 UJ	**2.8**	1.3 UJ	1.3 UJ	1.3 U	--	**3.4**	0.9 U	1.3 U	1.1 UJ
	TO-15SIM	**9**	**6**	**3.2**	**3.1**	**3.7**	**2.9**	**3**	**3.3**	**2**	**2**	**1.4**	**1.4**	**1.8**	**5.6**	**2.7**	**1.9**	**2.4**	**1.8**	--	**2.4**	**1.9**	**2.3**	**1.8**	**1.4**
Acetone	TO-15	--	--	--	--	--	**17 UJ**	**7.3**	**5.7**	**7.6 J**	**5.4**	**19**	**7.7**	**42**	**8.6**	**16**	**13**	**6.7**	**15**	**15**	--	**15 UJ**	0.9 U	**9.3**	**14**
	TO-15SIM	**5.46**	**4.1**	**8.3**	**6.3**	**6.3**	**6.7 J**	**6**	**12**	**7.9**	**2.8**	**3.7**	**3.1**	**2**	**19**	**6.8**	**4.7**	**5.5**	**4**	--	**3.9**	**4.3**	**5.8**	**4.3**	**4.6**
Benzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	**0.1**	**0.12**	**0.1**	**0.084**	**0.12**	**0.22**	0.071 U	0.11 U	0.067 U	**0.074**	**0.073 J**	0.081 U	**0.1**	**0.17**	0.076 U	**0.2**	**0.14**	**0.15**	--	**0.083**	**0.13**	**0.091**	**0.084**	**0.1**
Carbon disulfide	TO-15	--	--	--	--	--	4 U	**2.2 J**	1.5 U	1.4 U	1.3 U	**7.2**	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 UJ
Carbon tetrachloride	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	**0.19**	**0.049**	**0.036**	**0.03**	**0.15**	**0.039**	0.028 U	**0.073**	**0.032**	0.024 U	0.03 U	**0.032**	0.024 U	**0.047**	**0.038**	0.034 U	0.029 U	0.031 U	--	0.029 U	**0.026**	0.03 U	**0.041**	**0.042**
Chloroethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.07 U	0.058 U	0.07 U	0.059 U	0.06 U	0.071 U	0.071 U	0.11 U	0.067 U	0.059 U	0.074 U	0.081 U	0.059 U	0.074 U	0.076 U	0.085 U	0.072 U	0.078 U	--	0.072 U	0.062 U	0.076 U	0.068 U	0.066 U
Chloroform	TO-15	--	--	--	--	--	4 U	1.4 U	**1.8 J**	1.4 U	1.3 U	3 U	2.4 U	1.7 U	**1.8 J**	**2 J**	1.3 U	1.3 U	1.3 U	**1.6 J**	--	**1.4 J**	0.9 U	**1.6 J**	**2.9**
	TO-15SIM	**1.21**	**1**	**1.1**	**1**	**1.8**	**1.3**	**0.44**	**2.1**	**0.34**	**0.21**	**0.42**	**1.4**	**1.3**	**2.1**	**1.6**	**1.4**	**0.63**	**0.8**	--	**1.3**	**1.7**	**1.4**	**1.8**	**3.1**
Chloromethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	**1.9 J**	1.2 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	**0.14**	**0.23**	**0.19**	**0.13**	**0.18**	**0.34**	**0.17**	**0.16**	**0.28**	**0.1**	**0.14**	**0.12**	**0.1**	**0.43**	**0.18**	**0.2**	**0.18**	**0.19**	--	**0.41**	**0.11**	**0.1**	**0.18**	**0.24**
cis-1,2-Dichloroethene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	**54**	2.4 U	**5.1**	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	0.024 U	0.024 U	0.028 U	0.028 U	0.043 U	0.027 U	0.024 U	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	0.025 U	0.03 U	0.027 U	0.026U
cis-1,3-Dichloropropene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
Cyclohexane	TO-15	--	--	--	--	--	**14**	1.4 U	1.5 U	1.4 U	1.3 U	**15**	**9.2**	**21**	**1.4 J**	1.3 U	**4.3 UJ**	1.3 U	**2.4 UJ**	1.3 U	--	1.3 U	0.9 U	1.3 U	6.7 UJ
Dichlorodifluoromethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	0.024 U	**0.025**	**0.098**	**0.042**	**0.056**	**0.05**	0.024 U	0.03 U	0.032 U	0.024 U	**0.033**	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	0.025 U	0.03 U	**0.038**	**0.053**
Ethylbenzene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	**0.58**	**0.071**	**0.056**	**0.042**	**0.039**	**0.11**	**0.05**	0.043 U	**0.028**	**0.044**	**0.033**	0.032 U	**0.028**	**0.26**	**0.077**	**0.061**	**0.19**	**0.13**	--	**0.12**	**0.14**	**0.12**	**0.16**	**0.13**
Freon 113*	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	0.024 U	0.024 U	0.028 U	0.028 U	0.043 U	0.027 U	0.024 U	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	0.025 U	0.03 U	0.027 U	0.026 U
Hexachlorobutadiene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 UJ	1.1 UJ
Isopropanol	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
m,p-Xylene	TO-15	--	--	--	--	--	8 U	2.8 U	3 U	2.8 U	2.5 U	5.9 U	4.7 U	3.4 U	2.4 U	2.7 U	2.6 U	2.6 U	2.7 U	2.6 U	--	2.6 U	1.8 U	2.6 U	2.3 U
Methylene chloride	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.29 U	0.23 U	0.28 U	0.24 U	0.24 U	**0.39**	0.28 U	0.43 U	0.27 U	0.24 U	0.3 U	0.32 U	0.24 U	0.3 U	0.3 U	0.34 U	0.29 U	0.31 U	--	0.29 U	0.25 U	0.3 U	0.27 U	0.26 U
n-Hexane	TO-15	--	--	--	--	--	**180**	1.4 U	**14**	**5.9**	1.3 U	**200 J**	**81**	**210**	**17**	**3.1**	**38 uJ**	1.3 U	**23 UJ**	**1.4 J**	--	**4.6**	0.9 U	9 UJ	**64**
	TO-15SIM	0.14 U	**0.15**	0.14 U	0.12 U	**0.27**	**0.28**	0.14 U	**0.33**	**0.25**	**0.12**	0.15 U	0.16 U	**0.12**	**0.5**	**0.16**	**0.18**	0.14 U	0.16 U	--	0.14 U	**0.22**	**0.18**	0.14 U	0.13 U
o-Xylene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
Propylene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	**2.2 J**	**2.6**	**5.4 J**	2.4 U	**3.5**	1.2 U	1.3 U	**1.8 UJ**	1.3 U	**3**	1.3 U	--	**2.5 UJ**	**1.4 J**	1.3 U	**4.5**
Styrene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	**3.05**	**1.5**	**0.66**	**0.58**	**0.68**	**0.46**	**0.44**	**0.27**	**0.27**	**0.35**	**0.23**	**0.19**	**0.31**	**0.52**	**0.32**	**0.26**	**0.43**	**0.26**	--	**0.23**	**0.37**	**0.32 J**	**0.32 J**	**0.2 J**
Tetrachloroethene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	**2.5 J**	1.1 U
	TO-15SIM	0.03 U	0.023 U	0.028 U	**0.027**	0.024 U	**0.029**	0.028 U	0.043 U	0.027 U	**0.2**	0.03 U	0.032 U	0.024 U	0.03 U	0.03 U	0.034 U	0.029 U	0.031 U	--	**0.25**	0.025 U	0.03 U	0.027 U	0.026 U
Tetrahydrofuran	TO-15	--	--	--	--	--	**44**	**6.1**	**2 J**	**14**	1.3 U	**5.3 J**	**21**	**580**	1.2 U	1.3 U	1.3 U	**6.1**	1.3 U	1.3 U	--	**5.8**	0.9 U	1.3 U	1.1 U
Toluene	TO-15	--	--	--	--	--	**14 UJ**	1.4 U	**6.1**	**3.2**	1.3 U	**29**	**23**	**40**	**3.5**	1.3 U	**11 UJ**	1.3 U	**4.8**	**1.6 J**	--	**3**	0.9 U	2.5 UJ	5.7 UJ
	TO-15SIM	**0.64**	**0.52**	**0.33**	**0.24**	**0.26**	**1.1**	**0.29**	**0.22**	**0.25**	**0.2**	**0.43**	**0.22**	**0.19**	**1.2**	**0.26**	**0.47**	**0.5**	**0.45**	--	**0.45**	**0.76**	**0.49**	**0.62**	**0.49**
trans-1,2-Dichloroethene	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.14 U	0.12 U	0.14 U	0.12 U	0.12 U	0.14 U	0.14 U	0.21 U	0.13 U	0.12 U	0.15 U	0.16 U	0.12 U	0.15 U	0.15 U	0.17 U	0.14 U	0.16 U	--	0.14 U	0.12 U	0.15 U	0.14 U	0.13 U
Trichloroethene	TO-15	--	--	--	--	--	**8.3 J**	1.4 U	1.5 U	1.4 U	1.3 U	**46**	2.4 U	**17**	1.2 U	1.3 U	**1.9 UJ**	1.3 U	**3.1 UJ**	1.3 U	--	1.3 U	0.9 U	1.3 U	**5.3 J**
	TO-15SIM	**0.14**	**0.096**	**0.044**	**0.031**	**0.071**	**0.32**	**0.27**	**0.088**	**0.26**	**0.23**	**0.16**	**0.01**	**0.071**	**0.048**	**0.014**	**0.076**	**0.026**	**0.018**	--	**0.09**	**0.11**	**0.18**	**0.13**	**0.056**
Trichlorofluoromethane	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.03 U	**0.034**	**0.07**	**0.044**	**0.033**	**0.081**	**0.042**	**0.043**	**0.059**	**0.024**	**0.036**	0.032 U	**0.029**	**0.039**	0.03 U	0.034 U	0.029 U	0.031 U	--	0.029 U	0.025 U	0.03 U	**0.044**	**0.057**
Vinyl chloride	TO-15	--	--	--	--	--	4 U	1.4 U	1.5 U	1.4 U	1.3 U	3 U	2.4 U	1.7 U	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	--	1.3 U	0.9 U	1.3 U	1.1 U
	TO-15SIM	0.01 U	0.012 U	0.014 U	0.012 U	**0.012**	0.014 U	0.014 U	0.021 U	0.013 U	0.012 U	0.015 U	0.016 U	0.012 U	0.015 U	0.015 U	0.017 U	0.014 U	0.016 U	--	0.014 U	0.012 U	0.015 U	0.014 U	0.013 U
Xylenes (total)	TO-15SIM	**2.8**	**0.25**	**0.18**	**0.12**	**0.17**	**0.42**	**0.19**	0.13 U	**0.1**	**0.15**	**0.092**	**0.26**	**0.11**	**1.1**	**0.34**	**0.21**	**0.94**	**0.59**	--	**0.59**	**0.62**	**0.72**	0.081 U	**0.77**

Table 3.10
VOC Analytical Method Comparison for Vapor Samples from SP-104 and SP-109
Pemaco Superfund Site, Maywood, CA

Analyte	Station ID:	SP-109																									
	Description:	Post-Carbon																									
	Date:	5/31/2007	6/18/2007	7/12/2007	7/17/2007	7/25/2007	7/31/2007	8/7/2007	8/14/2007	9/5/2007	9/11/2007	9/18/2007	9/25/2007	10/1/2007	10/8/2007	10/15/2007	10/23/2007	10/29/2007	11/7/2007	11/15/2007	11/20/2007	11/27/2007	11/30/2007	12/4/2007	12/11/2007	12/20/2007	12/27/2007
	Units:	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Analyte	**Method**																										
1,1,2,2-Tetrachloroethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15 SIM	0.03 U	0.024 U	**0.15**	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	**0.077**	0.03 U	**0.048**	0.028 U	0.028 U
1,1-Dichloroethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	**0.024**	**0.031**	--	**0.097**	**0.17**	**0.44**	**0.3**	**0.084**
1,1-Dichloroethene	TO-15	--	--	1.3 U	1.4 U	1.3 U	**3.3**	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.01 U	0.012 U	0.015 U	0.011 U	0.014 U	0.015 U	0.014 U	0.011 U	0.015 U	**0.032**	**0.071**	**0.19**	**0.19**	**0.26**	**0.35**	**0.38**	**0.3**	**0.32**	**0.29**	**0.25**	--	**0.27**	**0.33**	**0.44**	**0.29**	**0.1**
1,2,4-Trichlorobenzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 UJ	4.6 U	14 U	14 U	1.3 UJ	**3**	1.3 U	1.4 UJ	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 UJ	1.3 UJ
	TO-15SIM	0.13 U	0.12 U	0.15 U	0.11 U	0.14 U	0.15 U	0.14 U	0.11 U	0.15 U	0.14 U	0.15 U	0.13 U	0.12 U	0.12 U	0.11 U	0.14 U	0.14 U	0.16 U	0.12 U	0.11 U	--	0.15 U	0.15 U	0.11 U	0.14 U	0.14 U
1,2,4-Trimethylbenzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
1,2-Dichlorotetrafluoroethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
1,3,5-Trimethylbenzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
1,4-Dichlorobenzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	0.03 U	0.03 U	0.023 U	0.028 U	0.028 U
1,4-Dioxane	TO-15	--	--	1.3 U	1.4 UJ	1.3 UJ	1.4 U	1.4 U	4.6 U	14 UJ	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 UJ	1.3 U
2-Butanone	TO-15	--	--	--	--	--	--	--	--	14 U	14 U	1.3 UJ	1.3 UJ	1.3 UJ	1.4 UJ	**29 UJ**	1.1 U	1.2 UJ	1.4 U	1.4 U	12 UJ	1.3 UJ	--	**2.8**	2.4 U	1.3 U	1.3 UJ
	TO-15SIM	**1.2**	**0.78**	**0.38**	**0.26**	**0.17**	**0.57**	**0.41**	**0.36**	**0.36**	**0.21**	**0.18**	**0.88**	**0.27**	**0.22**	**0.15**	**0.6**	**0.36**	**3.8**	**1.2**	**0.26**	--	**0.28**	**0.62**	**0.4**	**0.74**	**1.2**
Acetone	TO-15	--	--	**15**	**7.6**	**2.6**	4.3 UJ	**15**	**11 UJ**	**18 J**	14 U	**4.5 J**	**4.6**	**15**	**6.4**	**3.8**	**5.2**	**2.8**	**3.4**	**2.9**	12 U	**3.2**	--	**4 UJ**	**8.3 J**	**10**	**12**
	TO-15SIM	**4.62**	**1.6**	**2.8**	**0.66**	**0.9**	**2.2**	**2**	**0.87**	**1.4**	**0.81**	**0.91**	**2**	**2.1**	0.58 U	0.57 U	**1.5**	**1.4**	**9.1**	**6.4**	**1**	--	**2.1**	**2.2**	**1.5**	**2.2**	**5.4**
Benzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 UJ	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	**3.7**	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	**22 J**	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.08**	**0.1**	**0.099**	0.057 U	0.07 U	**0.084**	**0.13**	**0.066**	0.074 U	0.072 U	0.074 U	**0.76**	0.058 U	0.058 U	0.057 U	0.07 U	**0.18**	0.08 U	0.058 U	0.057 U	--	0.076 U	0.076 U	**0.06**	**0.1**	0.071 U
Carbon disulfide	TO-15	--	--	**1.9 J**	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	**3**	**2.2 J**	**1.5 J**	**1.8 J**	12 U	**1.4 J**	--	1.2 U	2.4 U	1.3 U	1.3 UJ
Carbon tetrachloride	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 UJ	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	0.03 U	0.03 U	0.023 U	**0.22**	**0.1**
Chloroethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.53**	0.06 U	0.076 U	0.057 U	0.07 U	0.074 U	0.07 U	0.057 U	0.074 U	0.072 U	0.074 U	0.063 U	0.058 U	0.058 U	0.057 U	0.07 U	0.071 U	0.08 U	0.058 U	0.057 U	--	0.076 U	0.076 U	0.057 U	0.07 U	0.071 U
Chloroform	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	**1.9 J**	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	**3.8 J**	**4.2**	**2.9**
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	**0.056**	**0.28**	**3.5**	**7.9**	**3.1**
Chloromethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 UJ	1.3 U	1.4 U	1.4 UJ	**1.7 J**	**1.9 J**	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 UJ	1.3 U	1.3 U
	TO-15SIM	**0.13**	**0.32**	**0.34**	**0.19**	**0.21**	**0.44**	**0.16**	**0.2**	**0.29**	**0.11**	**0.17**	**0.1**	**0.16**	**0.17**	**0.14**	**0.17**	**0.26**	**0.14**	**0.11**	**0.15**	--	**0.22**	**0.16**	**0.25**	**0.24**	**0.2**
cis-1,2-Dichloroethene	TO-15	--	--	1.3 U	1.4 U	1.3 U	**40**	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	**3.3 J**	**5.8**	**6**
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	**0.056**	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	**0.029**	**0.048**	--	**0.28**	**0.78**	**4.3**	**12**	**5.6**
cis-1,3-Dichloropropene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
Cyclohexane	TO-15	--	--	1.3 U	1.4 U	1.3 U	160 UJ	**13**	4.6 U	**24 J**	14 U	1.3 U	1.3 U	**24**	**11**	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	**300**	**4.6**	--	**11**	2.4 U	**71**	**51**
Dichlorodifluoromethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 UJ	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 UJ	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.03**	0.024 U	0.03 U	0.023 U	**0.031**	0.03 U	0.028 U	**0.024**	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	**0.037**	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	0.03 U	0.03 U	0.023 U	**0.033**	**0.063**
Ethylbenzene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.53**	**0.028**	**0.082**	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	**0.029**	0.023 U	**0.11**	**0.054**	**0.034**	**0.056**	**0.038**	--	**0.085**	**0.13**	**0.056**	**0.14**	**0.1**
Freon 113*	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	0.03 U	0.03 U	**0.12**	**0.07**	0.028 U
Hexachlorobutadiene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	**4.5**	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 UJ	1.3 UJ
Isopropanol	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
m,p-Xylene	TO-15	--	--	2.6 U	2.8 U	2.6 U	2.8 U	2.7 U	9.2 U	27 U	28 U	2.7 U	2.6 U	2.6 U	2.8 U	2.9 U	2.2 U	2.5 U	2.8 U	2.8 U	25 U	2.6 U	--	2.3 U	4.8 U	2.6 U	2.7 U
Methylene chloride	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.27 U	0.24 U	0.3 U	0.23 U	0.28 U	0.3 U	0.28 U	0.23 U	0.3 U	0.29 U	0.3 U	0.25 U	0.23 U	0.23 U	0.23 U	0.28 U	0.28 U	0.32 U	0.23 U	0.23 U	--	0.3 U	0.3 U	0.23 U	0.28 U	0.28 U
n-Hexane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1,800 UJ	**5**	4.6 U	**310**	14 U	**6.2**	1.3 U	**690**	**110**	1.4 U	1.1 U	1.2 U	**3.5 UJ**	1.4 U	**3100**	**62 J**	--	**230**	2.4 U	36 UJ	**120**
	TO-15SIM	0.13 U	0.12 U	0.15 U	0.11 U	0.14 U	**1.6**	0.14 U	0.11 U	0.15 U	0.14 U	0.15 U	0.13 U	0.12 U	0.12 U	0.11 U	0.14 U	**0.49**	0.16 U	0.12 U	0.11 U	--	0.15 U	0.15 U	0.11 U	0.14 U	0.14 U
o-Xylene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
Propylene	TO-15	--	--	**2.5 J**	**4.4**	**6.9**	**18**	**1.5 J**	4.6 U	14 U	14 U	**2.8**	1.3 UJ	**1.5 J**	**2.2 J**	1.4 U	1.1 U	1.2 U	**1.6 UJ**	1.4 U	12 U	1.3 U	--	**3 UJ**	2.4 U	1.3 U	**6.4**
Styrene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.08**	**0.061**	**0.17**	0.023 U	0.028 U	0.03 U	**0.041**	0.023 U	**0.03**	**0.031**	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	**0.12**	**0.037**	**0.036**	**0.046**	**0.027**	--	**0.068**	**0.12**	**0.051 J**	**0.12 J**	**0.11 J**
Tetrachloroethene	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	**21**	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	0.03 U	0.029 U	0.03 U	0.025 U	0.023 U	0.023 U	0.023 U	0.028 U	0.028 U	0.032 U	0.023 U	0.023 U	--	0.03 U	0.03 U	**0.027**	**0.031**	0.028 U
Tetrahydrofuran	TO-15	--	--	--	--	--	**2.6 J**	**4100**	**130**	14 U	14 U	**14**	1.3 U	1.3 U	1.4 U	**180 UJ**	1.1 U	1.2 U	**2.5 UJ**	1.4 U	12 U	1.3 U	--	**15**	2.4 U	**5.5**	**5.8**
Toluene	TO-15	--	--	1.3 U	1.4 U	1.3 U	130 UJ	1.4 U	4.6 U	**90**	14 U	**3**	1.3 U	**620**	**15**	1.4 U	**1.9 J**	1.2 U	**2.5 UJ**	1.4 U	**1400**	**12**	--	**44**	2.4 U	**20**	5.7 UJ
	TO-15SIM	**0.48**	**0.16**	**0.25**	0.023 U	**0.045**	**0.52**	**0.049**	**0.044**	**0.13**	**0.071**	**0.052**	**0.3**	0.023 U	**0.098**	0.023 U	**1.5**	**0.27**	**0.2**	**0.14**	**0.14**	--	**0.27**	**0.36**	**0.24**	**0.42**	**0.35**
trans-1,2-Dichloroethene	TO-15	--	--	1.3 U	1.4 U	1.3 U	**1.7 J**	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.13 U	0.12 U	0.15 U	0.11 U	0.14 U	0.15 U	0.14 U	0.11 U	0.15 U	0.14 U	0.15 U	0.13 U	0.12 U	0.12 U	0.11 U	0.14 U	0.14 U	0.16 U	0.12 U	0.11 U	--	**0.31**	**0.52**	**1.3**	**1.7**	**0.71**
Trichloroethene	TO-15	--	--	1.3 U	1.4 U	1.3 U	**360**	**27**	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	**3.3**	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	**1.3 J**	2.4 U	2.6 UJ	**16 J**
	TO-15SIM	**0.01**	**0.2**	**0.012**	**0.0089**	**0.019**	**0.36**	**0.0073**	**0.031**	**0.011**	**0.0092**	**0.018**	0.0038 U	0.0035 U	**0.0069**	**0.0034**	**0.0094**	**0.0043**	0.0048 U	**0.0082**	**0.0062**	--	**0.03**	**0.027**	**0.048**	**0.029**	**0.032**
Trichlorofluoromethane	TO-15	--	--	1.3 U	1.4 U	1.3 U	1.4 U	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	0.03 U	0.024 U	0.03 U	0.023 U	0.028 U	0.03 U	0.028 U	0.023 U	**0.032**	**0.035**	**0.041**	**0.043**	**0.049**	**0.057**	**0.039**	**0.036**	**0.042**	**0.047**	**0.045**	**0.051**	--	**0.098**	**0.089**	**0.13**	**0.06**	**0.062**
Vinyl chloride	TO-15	--	--	1.3 U	1.4 U	1.3 U	2.9 UJ	1.4 U	4.6 U	14 U	14 U	1.3 U	1.3 U	1.3 U	1.4 U	1.4 U	1.1 U	1.2 U	1.4 U	1.4 U	12 U	1.3 U	--	1.2 U	2.4 U	1.3 U	1.3 U
	TO-15SIM	**0.55**	**0.054**	**0.071**	**0.036**	**0.023**	**0.02**	**0.024**	**0.015**	0.015 U	0.014 U	0.015 U	0.013 U	0.012 U	0.012 U	0.011 U	0.014 U	0.014 U	0.016 U	**0.022**	**0.017**	--	0.015 U	0.015 U	**0.014**	0.014 U	0.014 U
Xylenes (total)	TO-15SIM	**2.6**	**0.15**	**0.28**	0.068 U	0.083 U	0.089 U	0.083 U	0.068 U	0.089 U	0.087 U	0.089 U	**0.07 J**	0.07 U	**0.29**	0.068 U	**0.41**	**0.32**	**0.12**	**0.25**	**0.16**	--	**0.41**	**0.5**	**0.57**	0.083 U	**0.62**

Notes:
Bolded results indicate positive detections
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete laboratory results, seeAppendix 4.
EPA Region 9 laboratory performed analyses using EPA Method TO-15 ; Air Toxics Ltd. performed analyses using EPA Method TO-15SIM.
* Freon 113 is reported as 1,1,2-Trichloro-1,2,2-trifluoroethane in the laboratory reports inAppendix 4.

NL - no limit; SIM - selective ion mode;
"--" - not available
U - not detected above the stated reporting limit; J - quantitative estimate; UJ - not detected at estimated reporting limit
ppbv - part per billion by volume

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**6/20/2007**				**6/21/2007**					
Station ID:	SP-104a	SP-109a			SP-104a			SP-109a		
Location:	Post -FTO	Post-Carbon			Post-FTO			Post-Carbon		
Dioxins / PCDDs	Post-FTO 6/20/07 (µg/dscm)	Post-Carbon 6/20/07 (µg/dscm)	TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**	Post-FTO 6/21/07 (µg/dscm)	TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**	Post-Carbon 6/21/07 (µg/dscm)	TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**
2,3,7,8-TCDD	NA	3.40E-06	1	3.40E-06	ND 7.78E-07	1	3.89E-07	ND 4.14E-07	1	2.07E-07
1,2,3,7,8-PeCDD	NA	4.85E-06	1	4.85E-06	1.97E-06	1	1.97E-06	ND 6.91E-07	1	3.46E-07
1,2,3,4,7,8-HxCDD	NA	2.22E-06	0.1	2.22E-07	2.48E-06	0.1	2.48E-07	ND 6.13E-07	0.1	3.07E-08
1,2,3,6,7,8-HxCDD	NA	3.56E-06	0.1	3.56E-07	3.12E-06	0.1	3.12E-07	ND 1.12E-06	0.1	5.60E-08
1,2,3,7,8,9-HxCDD	NA	2.99E-06	0.1	2.99E-07	3.28E-06	0.1	3.28E-07	ND 1.18E-06	0.1	5.89E-08
1,2,3,4,6,7,8,-HpCDD	NA	1.02E-05	0.01	1.02E-07	1.67E-05	0.01	1.67E-07	1.83E-06	0.01	1.83E-08
OCDD	NA	1.51E-05	0.0003	4.52E-09	2.68E-05	0.0003	8.05E-09	4.37E-06	0.0003	1.31E-09
Furans / PCDFs										
2,3,7,8-TCDF	NA	1.56E-05	0.1	1.56E-06	2.99E-06	0.1	2.99E-07	1.69E-06	0.1	1.69E-07
1,2,3,7,8-PeCDF	NA	1.44E-05	0.03	4.31E-07	4.03E-06	0.03	1.21E-07	1.19E-06	0.03	3.58E-08
2,3,4,7,8-PeCDF	NA	1.57E-05	0.3	4.72E-06	ND 4.67E-06	0.3	7.00E-07	ND 8.02E-07	0.3	1.20E-07
1,2,3,4,7,8-HxCDF	NA	7.66E-06	0.1	7.66E-07	5.79E-06	0.1	5.79E-07	ND 5.91E-07	0.1	2.96E-08
1,2,3,6,7,8-HxCDF	NA	7.88E-06	0.1	7.88E-07	5.66E-06	0.1	5.66E-07	6.26E-07	0.1	6.26E-08
2,3,4,6,7,8-HxCDF	NA	5.86E-06	0.1	5.86E-07	5.02E-06	0.1	5.02E-07	ND 5.73E-07	0.1	2.87E-08
1,2,3,7,8,9-HxCDF	NA	ND 1.26E-06	0.1	6.29E-08	ND 1.28E-06	0.1	6.42E-08	ND 2.48E-07	0.1	1.24E-08
1,2,3,4,6,7,8-HpCDF	NA	1.21E-05	0.01	1.21E-07	1.94E-05	0.01	1.94E-07	1.23E-06	0.01	1.23E-08
1,2,3,4,7,8,9-HpCDF	NA	ND 1.69E-06	0.01	8.46E-09	3.29E-06	0.01	3.29E-08	ND 2.92E-07	0.01	1.46E-09
OCDF	NA	2.63E-06	0.0003	7.88E-10	1.28E-05	0.0003	3.85E-09	ND 1.81E-06	0.0003	2.72E-10
SUM of TEQ Dioxins & Furans				**1.83E-05**			**6.49E-06**			**1.19E-06**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *				2.00E-04			n/a			2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**8/3/2007**							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post-FTO 8/3/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)	Post-Carbon 8/3/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)
2,3,7,8-TCDD	ND	2.49E-07	1	1.25E-07	ND	2.67E-07	1	1.34E-07
1,2,3,7,8-PeCDD	ND	3.24E-07	1	1.62E-07	ND	3.26E-07	1	1.63E-07
1,2,3,4,7,8-HxCDD	ND	3.93E-07	0.1	1.97E-08	ND	3.89E-07	0.1	1.95E-08
1,2,3,6,7,8-HxCDD	ND	3.80E-07	0.1	1.90E-08	ND	3.74E-07	0.1	1.87E-08
1,2,3,7,8,9-HxCDD	ND	3.95E-07	0.1	1.98E-08	ND	3.89E-07	0.1	1.95E-08
1,2,3,4,6,7,8,-HpCDD	ND	7.99E-07	0.01	3.99E-09		2.16E-06	0.01	2.16E-08
OCDD	ND,J,B	3.11E-06	0.0003	4.67E-10	ND, B	2.95E-07	0.0003	4.43E-11
Furans / PCDFs								
2,3,7,8-TCDF	ND	3.16E-07	0.1	1.58E-08	ND	2.43E-07	0.1	1.22E-08
1,2,3,7,8-PeCDF	ND	5.86E-07	0.03	8.79E-09	ND	7.21E-07	0.03	1.08E-08
2,3,4,7,8-PeCDF	ND	6.19E-07	0.3	9.28E-08	ND	7.62E-07	0.3	1.14E-07
1,2,3,4,7,8-HxCDF	ND, EMPC	1.44E-07	0.1	7.22E-09	ND, EMPC	1.71E-07	0.1	8.57E-09
1,2,3,6,7,8-HxCDF	ND	1.02E-07	0.1	5.11E-09	ND, EMPC	1.05E-07	0.1	5.26E-09
2,3,4,6,7,8-HxCDF	ND	1.18E-07	0.1	5.88E-09	ND	1.34E-07	0.1	6.71E-09
1,2,3,7,8,9-HxCDF	ND	1.47E-07	0.1	7.37E-09	ND	1.68E-07	0.1	8.41E-09
1,2,3,4,6,7,8-HpCDF		3.54E-07	0.01	3.54E-09		4.31E-07	0.01	4.31E-09
1,2,3,4,7,8,9-HpCDF	ND	3.89E-07	0.01	1.94E-09	ND	2.25E-07	0.01	1.12E-09
OCDF		2.68E-07	0.0003	8.05E-11	ND	9.59E-07	0.0003	1.44E-10
SUM of TEQ Dioxins & Furans				**4.98E-07**				**5.48E-07**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**8/16/2007**							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post-FTO 8/16/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)	Post-Carbon 8/16/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)
2,3,7,8-TCDD	J	1.76E-06	1	1.76E-06	ND	2.84E-07	1	1.42E-07
1,2,3,7,8-PeCDD	J	7.39E-06	1	7.39E-06	ND	2.10E-07	1	1.05E-07
1,2,3,4,7,8-HxCDD	J	7.30E-06	0.1	7.30E-07	ND	5.81E-07	0.1	2.90E-08
1,2,3,6,7,8-HxCDD		1.25E-05	0.1	1.25E-06	ND	5.38E-07	0.1	2.69E-08
1,2,3,7,8,9-HxCDD	J	1.22E-05	0.1	1.22E-06	ND	5.67E-07	0.1	2.83E-08
1,2,3,4,6,7,8,-HpCDD		7.39E-05	0.01	7.39E-07	J	8.51E-07	0.01	8.51E-09
OCDD	B	8.27E-05	0.0003	2.48E-08	ND, J,B	2.47E-06	0.0003	3.71E-10
Furans / PCDFs								
2,3,7,8-TCDF		6.25E-06	0.1	6.25E-07	ND	3.56E-07	0.1	1.78E-08
1,2,3,7,8-PeCDF	J	8.27E-06	0.03	2.48E-07	ND	4.89E-07	0.03	7.34E-09
2,3,4,7,8-PeCDF	J	1.12E-05	0.3	3.36E-06	ND	5.00E-07	0.3	7.50E-08
1,2,3,4,7,8-HxCDF	J	9.54E-06	0.1	9.54E-07	ND	1.21E-07	0.1	6.06E-09
1,2,3,6,7,8-HxCDF	J	8.81E-06	0.1	8.81E-07	ND	1.12E-07	0.1	5.61E-09
2,3,4,6,7,8-HxCDF	J	7.69E-06	0.1	7.69E-07	ND	1.30E-07	0.1	6.48E-09
1,2,3,7,8,9-HxCDF	J	2.59E-06	0.1	2.59E-07	ND	1.54E-07	0.1	7.72E-09
1,2,3,4,6,7,8-HpCDF		1.89E-05	0.01	1.89E-07	ND, EMPC	1.89E-07	0.01	9.44E-10
1,2,3,4,7,8,9-HpCDF	J	2.22E-06	0.01	2.22E-08	ND	1.82E-07	0.01	9.08E-10
OCDF	J	6.67E-06	0.0003	2.00E-09	ND	5.32E-07	0.0003	7.99E-11
SUM of TEQ Dioxins & Furans				**2.04E-05**				**4.68E-07**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**9/5/2007**					
Station ID:	SP-104a			SP-109a		
Location:	Post-FTO			Post-Carbon		
Dioxins / PCDDs	Post-FTO 9/05/07 (µg/dscm)	TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)	Post-Carbon 9/05/07 (µg/dscm)	TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)
2,3,7,8-TCDD	ND 6.95E-07	1	3.47E-07	ND 7.42E-07	1	3.71E-07
1,2,3,7,8-PeCDD	ND 7.59E-07	1	3.79E-07	ND 2.69E-06	1	1.35E-06
1,2,3,4,7,8-HxCDD	ND 1.65E-06	0.1	8.25E-08	J 1.56E-06	0.1	1.56E-07
1,2,3,6,7,8-HxCDD	ND 1.53E-06	0.1	7.66E-08	J 3.63E-06	0.1	3.63E-07
1,2,3,7,8,9-HxCDD	ND 1.61E-06	0.1	8.06E-08	J 2.85E-06	0.1	2.85E-07
1,2,3,4,6,7,8,-HpCDD	ND 2.03E-06	0.01	1.01E-08	2.67E-05	0.01	2.67E-07
OCDD	ND 4.84E-06	0.0003	7.26E-10	4.44E-05	0.0003	1.33E-08
Furans / PCDFs						
2,3,7,8-TCDF	ND 1.03E-06	0.1	5.16E-08	J 1.41E-06	0.1	1.41E-07
1,2,3,7,8-PeCDF	ND 1.29E-06	0.03	1.94E-08	ND 1.86E-06	0.03	2.79E-08
2,3,4,7,8-PeCDF	ND 1.33E-06	0.3	1.99E-07	J 2.46E-06	0.3	7.38E-07
1,2,3,4,7,8-HxCDF	ND 6.57E-07	0.1	3.28E-08	J 1.62E-06	0.1	1.62E-07
1,2,3,6,7,8-HxCDF	ND 6.07E-07	0.1	3.03E-08	ND, EMPC 1.35E-06	0.1	6.75E-08
2,3,4,6,7,8-HxCDF	ND 7.02E-07	0.1	3.51E-08	J 1.58E-06	0.1	1.58E-07
1,2,3,7,8,9-HxCDF	ND 4.55E-07	0.1	2.28E-08	ND 7.70E-07	0.1	3.85E-08
1,2,3,4,6,7,8-HpCDF	ND 1.65E-06	0.01	8.25E-09	J 4.90E-06	0.01	4.90E-08
1,2,3,4,7,8,9-HpCDF	ND 6.16E-07	0.01	3.08E-09	ND 1.39E-06	0.01	6.95E-09
OCDF	ND 3.53E-06	0.0003	5.30E-10	ND 2.94E-06	0.0003	4.41E-10
SUM of TEQ Dioxins & Furans			**1.38E-06**			**4.19E-06**
Dioxin & Furan NESHAP Limit for Comparison □(not a regulatory standard) *						2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**9/19/2007**							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post-FTO 9/19/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)	Post-Carbon 9/19/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)
2,3,7,8-TCDD	ND	4.34E-07	1	2.17E-07	ND	7.23E-07	1	3.62E-07
1,2,3,7,8-PeCDD	ND	6.37E-07	1	3.19E-07	ND	8.59E-07	1	4.29E-07
1,2,3,4,7,8-HxCDD	ND	9.23E-07	0.1	4.62E-08	J	6.97E-07	0.1	6.97E-08
1,2,3,6,7,8-HxCDD	ND	1.08E-06	0.1	5.40E-08	J	9.52E-07	0.1	9.52E-08
1,2,3,7,8,9-HxCDD	ND	1.10E-06	0.1	5.50E-08	ND	1.13E-06	0.1	5.66E-08
1,2,3,4,6,7,8,-HpCDD	ND,EMPC	1.30E-06	0.01	6.49E-09	J	7.33E-06	0.01	7.33E-08
OCDD	J	3.12E-06	0.0003	9.36E-10	J	1.25E-05	0.0003	3.76E-09
Furans / PCDFs								
2,3,7,8-TCDF	ND	1.02E-06	0.1	5.08E-08	J	7.65E-07	0.1	7.65E-08
1,2,3,7,8-PeCDF	ND	1.08E-06	0.03	1.62E-08	J	6.85E-07	0.03	2.06E-08
2,3,4,7,8-PeCDF	ND	1.14E-06	0.3	1.71E-07	ND,EMPC	8.61E-07	0.3	1.29E-07
1,2,3,4,7,8-HxCDF	ND	6.35E-07	0.1	3.17E-08	ND,EMPC	5.53E-07	0.1	2.77E-08
1,2,3,6,7,8-HxCDF	ND	5.95E-07	0.1	2.98E-08	ND	7.35E-07	0.1	3.67E-08
2,3,4,6,7,8-HxCDF	ND	6.59E-07	0.1	3.29E-08	J	6.91E-07	0.1	6.91E-08
1,2,3,7,8,9-HxCDF	ND	4.55E-07	0.1	2.27E-08	ND	3.82E-07	0.1	1.91E-08
1,2,3,4,6,7,8-HpCDF	ND	1.67E-06	0.01	8.33E-09	J	1.51E-06	0.01	1.51E-08
1,2,3,4,7,8,9-HpCDF	ND	6.00E-07	0.01	3.00E-09	ND	6.60E-07	0.01	3.30E-09
OCDF	ND	2.36E-06	0.0003	3.54E-10	ND	1.88E-06	0.0003	2.81E-10
SUM of TEQ Dioxins & Furans				**1.07E-06**				**1.49E-06**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**10/4/2007**							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post-FTO 8/15/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)	Post-Carbon 8/15/07 (µg/dscm)		TEFs WHO 2005	TEQ WHO 2005 (µg/dscm)
2,3,7,8-TCDD	ND	5.15E-07	1	2.57E-07	ND	1.90E-07	1	9.51E-08
1,2,3,7,8-PeCDD	ND	9.81E-07	1	4.91E-07	ND	4.54E-07	1	2.27E-07
1,2,3,4,7,8-HxCDD	ND	5.12E-07	0.1	2.56E-08	ND	6.38E-07	0.1	3.19E-08
1,2,3,6,7,8-HxCDD	ND	1.04E-06	0.1	5.22E-08	ND	6.01E-07	0.1	3.00E-08
1,2,3,7,8,9-HxCDD	ND	1.08E-06	0.1	5.42E-08	ND	6.23E-07	0.1	3.12E-08
1,2,3,4,6,7,8,-HpCDD	J	2.44E-06	0.01	2.44E-08	ND	6.50E-07	0.01	3.25E-09
OCDD	J	4.49E-06	0.0003	1.35E-09	J	1.09E-06	0.0003	3.28E-10
Furans / PCDFs								
2,3,7,8-TCDF	J	1.02E-06	0.1	1.02E-07	ND	2.47E-07	0.1	1.23E-08
1,2,3,7,8-PeCDF	J	6.66E-07	0.03	2.00E-08	ND	5.89E-07	0.03	8.84E-09
2,3,4,7,8-PeCDF	J	8.80E-07	0.3	2.64E-07	ND	6.20E-07	0.3	9.29E-08
1,2,3,4,7,8-HxCDF	J	7.72E-07	0.1	7.72E-08	ND	2.64E-07	0.1	1.32E-08
1,2,3,6,7,8-HxCDF	J	7.24E-07	0.1	7.24E-08	ND	2.47E-07	0.1	1.23E-08
2,3,4,6,7,8-HxCDF	J	4.84E-07	0.1	4.84E-08	ND	2.73E-07	0.1	1.37E-08
1,2,3,7,8,9-HxCDF	ND	3.41E-07	0.1	1.70E-08	ND	3.24E-07	0.1	1.62E-08
1,2,3,4,6,7,8-HpCDF	J	1.71E-06	0.01	1.71E-08	ND	4.07E-07	0.01	2.03E-09
1,2,3,4,7,8,9-HpCDF	ND	4.06E-07	0.01	2.03E-09	ND	2.54E-07	0.01	1.27E-09
OCDF	ND	2.24E-06	0.0003	3.36E-10	ND	8.27E-07	0.0003	1.24E-10
SUM of TEQ Dioxins & Furans				**1.53E-06**				**5.92E-07**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	**11/15/2007**							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post-FTO 8/15/07 (µg/dscm)		TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**	Post-Carbon 8/15/07 (µg/dscm)		TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**
2,3,7,8-TCDD	ND	8.68E-07	1	4.34E-07	ND	8.36E-07	1	4.18E-07
1,2,3,7,8-PeCDD	ND	9.56E-07	1	4.78E-07	ND	1.17E-06	1	5.86E-07
1,2,3,4,7,8-HxCDD	ND	3.99E-06	0.1	2.00E-07	ND	2.32E-06	0.1	1.16E-07
1,2,3,6,7,8-HxCDD	ND	1.16E-06	0.1	5.78E-08	ND	8.97E-07	0.1	4.49E-08
1,2,3,7,8,9-HxCDD	ND	1.19E-06	0.1	5.94E-08	ND	9.24E-07	0.1	4.62E-08
1,2,3,4,6,7,8,-HpCDD	ND	1.42E-06	0.01	7.11E-09	ND	1.86E-06	0.01	9.28E-09
OCDD	J	5.32E-06	0.0003	1.60E-09	J	7.03E-06	0.0003	2.11E-09
Furans / PCDFs								
2,3,7,8-TCDF	ND	1.33E-05	0.1	6.64E-07	ND	1.28E-06	0.1	6.41E-08
1,2,3,7,8-PeCDF	ND	6.92E-07	0.03	1.04E-08	ND	9.46E-07	0.03	1.42E-08
2,3,4,7,8-PeCDF	ND,EMPC	5.83E-07	0.3	8.74E-08	ND	9.83E-07	0.3	1.47E-07
1,2,3,4,7,8-HxCDF	ND	8.57E-07	0.1	4.29E-08	ND	1.05E-06	0.1	5.26E-08
1,2,3,6,7,8-HxCDF	ND	7.64E-07	0.1	3.82E-08	ND	9.38E-07	0.1	4.69E-08
2,3,4,6,7,8-HxCDF	ND	8.36E-07	0.1	4.18E-08	ND	1.03E-06	0.1	5.13E-08
1,2,3,7,8,9-HxCDF	ND	9.72E-07	0.1	4.86E-08	ND	1.19E-06	0.1	5.96E-08
1,2,3,4,6,7,8-HpCDF	ND	9.08E-07	0.01	4.54E-09	ND	1.39E-06	0.01	6.96E-09
1,2,3,4,7,8,9-HpCDF	ND	1.05E-06	0.01	5.27E-09	ND	1.62E-06	0.01	8.08E-09
OCDF	ND	1.57E-06	0.0003	2.35E-10	ND	2.08E-06	0.0003	3.12E-10
SUM of TEQ Dioxins & Furans				**2.18E-06**				**1.67E-06**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Table 3.11
PCDD and PCDF Analytical Results for Vapor Samples from SP-104a and SP-109a
Pemaco Superfund Site, Maywood, CA

Sample Date:	12/12/2007							
Station ID:	SP-104a				SP-109a			
Location:	Post-FTO				Post-Carbon			
Dioxins / PCDDs	Post FTO (µg/dscm)		TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**	Post Carbon (µg/dscm)		TEFs WHO 2005	**TEQ WHO 2005 (µg/dscm)**
2,3,7,8-TCDD	ND	1.50E-07	1	7.50E-08	ND	3.30E-07	1	1.65E-07
1,2,3,7,8-PeCDD	ND	2.46E-07	1	1.23E-07	ND	4.78E-07	1	2.39E-07
1,2,3,4,7,8-HxCDD	ND	3.46E-07	0.1	1.73E-08	ND	4.24E-07	0.1	2.12E-08
1,2,3,6,7,8-HxCDD	ND	3.27E-07	0.1	1.64E-08	ND	4.03E-07	0.1	2.01E-08
1,2,3,7,8,9-HxCDD	ND	3.36E-07	0.1	1.68E-08	ND	4.15E-07	0.1	2.08E-08
1,2,3,4,6,7,8,-HpCDD	ND	3.11E-07	0.01	1.55E-09	ND,EMPC	1.28E-06	0.01	6.38E-09
OCDD	J	3.78E-06	0.0003	1.13E-09	ND,EMPC	3.34E-06	0.0003	5.02E-10
Furans / PCDFs								
2,3,7,8-TCDF	J	9.46E-07	0.1	9.46E-08	ND	3.66E-07	0.1	1.83E-08
1,2,3,7,8-PeCDF	ND	2.32E-07	0.03	3.48E-09	ND	4.36E-07	0.03	6.54E-09
2,3,4,7,8-PeCDF	ND	2.41E-07	0.3	3.62E-08	ND	4.53E-07	0.3	6.79E-08
1,2,3,4,7,8-HxCDF	ND	2.48E-07	0.1	1.24E-08	ND	3.01E-07	0.1	1.51E-08
1,2,3,6,7,8-HxCDF	ND	2.20E-07	0.1	1.10E-08	ND	2.70E-07	0.1	1.35E-08
2,3,4,6,7,8-HxCDF	ND	2.41E-07	0.1	1.21E-08	ND	2.95E-07	0.1	1.47E-08
1,2,3,7,8,9-HxCDF	ND	2.81E-07	0.1	1.40E-08	ND	3.43E-07	0.1	1.71E-08
1,2,3,4,6,7,8-HpCDF	ND	2.99E-07	0.01	1.50E-09	ND	4.30E-07	0.01	2.15E-09
1,2,3,4,7,8,9-HpCDF	ND	3.48E-07	0.01	1.74E-09	ND	5.01E-07	0.01	2.50E-09
OCDF	ND	5.52E-07	0.0003	8.28E-11	ND	1.22E-06	0.0003	1.83E-10
SUM of TEQ Dioxins & Furans				**4.38E-07**				**6.31E-07**
Dioxin & Furan NESHAP Limit for Comparison (not a regulatory standard) *								2.00E-04

Notes:

* Dioxin & Furan NESHAP Limit of 0.2 nanogram (ng) TEQ/ dscm (equals 2.00E-04 µg/dscm) is presented for the purpose of comparison. NESHAP is not a regulatory standard for the Pemaco Treatment Plant.

Analyses were performed by Vista Analytical Laboratory using method CARB 428.

Complete lab reports are provided in Appendix 4.

ND - not detected above the stated reporting limit; For TEQ calculations half of the reporting limit was used (in blue)

EMPC - estimated maximum possible concentration; Identification of the congener was not possible due to interferences. The congener is reported as non-detected at elevated detection limit.

CARB - California Air Resources Board

FTO - flameless thermal oxidizer

NESHAP - National Emission Standards for Hazardous Air Pollutants

PCDD - polychlorinated dibenzodioxin

PCDF - polychlorinated dibenzofuran

TEF - toxic equivalency factor

TEQ - toxic equivalent

WHO - World Health Organization

J - quantitative estimate; B - result is associated with method blank contamination; NA - not applicable

µg/dscm - microgram per dry standard cubic meter

Table 3.12
QA/QC of Analytical Results for Vapor Samples
Pemaco Superfund Site, Maywood, CA

Sample ID	Sample Type	Date	Analyte	Concentration[1] (ppbv)
FIELDQC-070614-E	Trip Blank	6/14/2007	Cyclohexane	1.5
FIELDQC-070614-E	Trip Blank	6/14/2007	Dimethylbutanes	10 J
FIELDQC-070614-E	Trip Blank	6/14/2007	Hexachlorobutadiene	0.5 J
FIELDQC-070614-E	Trip Blank	6/14/2007	Methylcyclopentane	6 J
FIELDQC-070614-E	Trip Blank	6/14/2007	Methylpentane	50 J
FIELDQC-070614-E	Trip Blank	6/14/2007	n-Hexane	12
FIELDQC-070614-E	Trip Blank	6/14/2007	Propylene	1.1
FIELDQC-070614-E	Trip Blank	6/14/2007	Trichloroethene	1
FIELDQC-070614-A	Trip Blank	6/14/2007	n-Hexane	1
FIELDQC-070614-A	Trip Blank	6/14/2007	Trichloroethene	0.5 J
SP-109-B-070712	Trip Blank	7/12/2007	Acetone	0.8 J
SP-BLANK-070731	Trip Blank	7/31/2007	Acetone	1.1 J
SP-BLANK-070731	Trip Blank	7/31/2007	Benzene	0.8 J
SP-BLANK-070731	Trip Blank	7/31/2007	*cis*-1,2-Dichloroethene	5.1
SP-BLANK-070731	Trip Blank	7/31/2007	Cyclohexane	90 J
SP-BLANK-070731	Trip Blank	7/31/2007	Dimethylbutanes	440 J
SP-BLANK-070731	Trip Blank	7/31/2007	Dimethylpentane	99 J
SP-BLANK-070731	Trip Blank	7/31/2007	Methylcyclopentane	380 J
SP-BLANK-070731	Trip Blank	7/31/2007	Methylhexane	92 J
SP-BLANK-070731	Trip Blank	7/31/2007	Methylpentane	3,000 J
SP-BLANK-070731	Trip Blank	7/31/2007	n-Hexane	970
SP-BLANK-070731	Trip Blank	7/31/2007	Toluene	110
SP-BLANK-070731	Trip Blank	7/31/2007	Trichloroethene	15 J
SP-BLANK-070731	Trip Blank	7/31/2007	Vinyl chloride	0.6 J
SP-BLANK-070807	Trip Blank	8/7/2007	Acetone	0.5 J
SP-BLANK-070807	Trip Blank	8/7/2007	Tetrahydrofuran	9.8
SP-900-070814	Trip Blank	8/14/2007	Acetone	3.8
SP-900-070814	Trip Blank	8/14/2007	Isopropanol	1.1
SP-900-070814	Trip Blank	8/14/2007	n-Hexane	3.7
SP-900-070814	Trip Blank	8/14/2007	Tetrahydrofuran	2.4
SP-900-070814	Trip Blank	8/14/2007	Toluene	3
SP-900-070814	Trip Blank	8/14/2007	Methylbutanes	7.8 J
SP-900-070814	Trip Blank	8/14/2007	Methylpentane	4.5 J
SP-900-20071015	Trip Blank	10/15/2007	2-Butanone	16
SP-900-20071015	Trip Blank	10/15/2007	Tetrahydrofuran	68
SP-900-20071107	Trip Blank	11/7/2007	1,1-Dichloroethene	0.9 J
SP-900-20071107	Trip Blank	11/7/2007	Benzene	2.9
SP-900-20071107	Trip Blank	11/7/2007	*cis*-1,2-Dichloroethene	5
SP-900-20071107	Trip Blank	11/7/2007	Cyclohexane	33
SP-900-20071107	Trip Blank	11/7/2007	Dimethylbutanes	97 J
SP-900-20071107	Trip Blank	11/7/2007	Dimethylcyclohexane	6.6 J
SP-900-20071107	Trip Blank	11/7/2007	Dimethylpentane	81 J
SP-900-20071107	Trip Blank	11/7/2007	*m,p*-Xylene	2.1
SP-900-20071107	Trip Blank	11/7/2007	Methylcyclopentane	200 J
SP-900-20071107	Trip Blank	11/7/2007	Methylhexane	40 J
SP-900-20071107	Trip Blank	11/7/2007	Methylpentane	1,220 J
SP-900-20071107	Trip Blank	11/7/2007	n-Hexane	380 J
SP-900-20071107	Trip Blank	11/7/2007	*o*-Xylene	0.5 J
SP-900-20071107	Trip Blank	11/7/2007	Propylene	0.5 J
SP-900-20071107	Trip Blank	11/7/2007	Tetrahydrofuran	0.7 J
SP-900-20071107	Trip Blank	11/7/2007	Toluene	51
SP-900-20071107	Trip Blank	11/7/2007	Trichloroethene	8.2

Table 3.12
QA/QC of Analytical Results for Vapor Samples
Pemaco Superfund Site, Maywood, CA

Sample ID	Sample Type	Date	Analyte	Concentration[1] (ppbv)
SP-900-20071120	Trip Blank	11/20/2007	Cyclohexane	0.8 J
SP-900-20071120	Trip Blank	11/20/2007	Methylpentane	6.9 J
SP-900-20071120	Trip Blank	11/20/2007	n-Hexane	5.5
SP-900-20071120	Trip Blank	11/20/2007	Toluene	0.8 J
SP-900-20071120	Trip Blank	11/20/2007	Trichloroethene	0.7 J
SP-900-20071204	Trip Blank	12/4/2007	Acetone	1.9
SP-900-20071204	Trip Blank	12/4/2007	Chloromethane	0.5 J
SP-900-20071204	Trip Blank	12/4/2007	Propylene	1.2
SP-900-20071220	Trip Blank	12/20/2007	Cyclohexane	1.4
SP-900-20071220	Trip Blank	12/20/2007	Methylcyclopentane	3.8 J
SP-900-20071220	Trip Blank	12/20/2007	Methylpentane	19.7 J
SP-900-20071220	Trip Blank	12/20/2007	n-Hexane	16
SP-900-20071220	Trip Blank	12/20/2007	Toluene	1.9
SP-900-20071220	Trip Blank	12/20/2007	Trichloroethene	1 J
SP-900-20071227	Trip Blank	12/27/2007	Cyclohexane	0.8 J
SP-900-20071227	Trip Blank	12/27/2007	Methylpentane	2.6 J
SP-900-20071227	Trip Blank	12/27/2007	n-Hexane	5.3
SP-900-20071227	Trip Blank	12/27/2007	Toluene	1.5

Notes:

1 - Any VOC detected in the sample (other than the common volatile laboratory contaminants), that was also detected in the trip blank, was qualified with "UJ" if the sample concentration was less than five (5) times the blank concentration. For the common laboratory contaminants (methylene chloride, acetone, 2-butanone, and cychlohexane), the results were qualified with "UJ" when the sample concentration was less than ten (10) times the blank concentration.

Analyses were performed by EPA Region 9 laboratory using EPA Method TO-15.

Complete lab reports are provided in Appendix 4.

QA/QC - quality assurance/quality control; VOC - volatile organic compound

UJ - not detected at estimated reporting limit; J - quantitative estimate

ppbv - part per billion by volume

Table 3.13
Vapor Treatment System Performance
Pemaco Superfund Site, Maywood, CA

Month	Notes	Monthly Operating Time	Monthly Percent Uptime	Average Process Flow Rate	Average Influent PID Concentration[1]	Cumulative Vapor Volume Treated	TCE Mass Removed[2]				VOC Mass Removed[2]			
							Average Influent Concentration	Monthly Mass	Cumulative Mass	Average Removal Rate	Average Influent Concentration	Monthly Mass	Cumulative Mass	Average Removal Rate
	Units:	(hours)	(%)	(scfm)	(ppmv)	(scf)	(ppmv)	(pounds)	(pounds)	(lbs/day)	(ppmv)	(pounds)	(pounds)	(lbs/day)
May	a	259	39	623	223	10,732,272	7.6	27	27	1.5	561	1,305	1,305	73
June	b	458	64	436	23	30,994,464	5.9	41	68	1.4	342	1,790	3,095	60
July	b	406	55	381	82	50,895,858	4.7	29	97	0.9	432	1,767	4,862	57
August	c	482	65	418	301	73,348,734	4.3	26	124	0.9	451	2,111	6,973	68
September		719	100	650	582	101,561,346	2.7	28	152	0.9	412	2,437	9,410	81
October		732	98	632	506	129,442,854	1.5	17	169	0.6	314	1,965	11,375	63
November	d	580	81	695	279	152,701,905	1.6	12	181	0.4	151	761	12,136	25
December		679	91	591	285	176,696,475	2.1	16	197	0.5	115	601	12,736	19

Total Mass of TCE Removed during 2007 (pounds)	**197**
Total Mass of VOCs Removed during 2007 (pounds)	**12,736**
Average TCE Removal Rate in 2007 (lbs/day)	**0.88**
Average VOC Removal Rate in 2007 (lbs/day)	**56**
Average Vapor Flow Rate during 2007 (scfm)	**553**
Cumulative Volume of Vapor Treated during 2007 (scf)	**176,696,475**
FTO Operating Time during 2007 (hours)	**4,314**
FTO Percent Uptime during 2007 (%)	**74**

Notes:

1 - Concentrations were measured with a Photoionization Detector (PID) calibrated to 100 ppmv isobutylene.
2 - Concentrations are based on the reading interpolated based on previous or subsequent readings.
Analyses for VOCs were performed by EPA Region 9 laboratory using method TO-15.
a - The vapor treatment system began operation on 5/4/07 and started 24-hour operation on 5/17/07.
b - The FTO was offline during 6/22/07 to 7/13/07 due to maintenance and condensate sump retrofit.
c - The FTO was offline during 8/21/07 to 8/31/07 due to hot spot issues on the FTO bellows.
d - The FTO was offline due to failure part repairs.
TCE - trichloroethene; VOC - volatile organic compound
lbs/day - pounds per days; ppmv = parts per million by volume; scf - standard cubic feet; scfm - standard cubic feet per minute

Table 3.14
Analytical Results for SP-104a and SP-109a Vapor Samples
Pemaco Superfund Site, Maywood, CA

				Station ID:	**SP-104a**	**SP-109a**	**SP-104a**	**SP-109a**	**SP-104a**	**SP-109a**	**SP-104a**	**SP-109a**
				Description:	**Post-FTO**	**Post-GAC**	**Post-FTO**	**Post-GAC**	**Post-FTO**	**Post-GAC**	**Post-FTO**	**Post-GAC**
				Date:	9/5/2007		9/19/2007		10/4/2007		11/15/2007	
Analyte	**Laboratory[1]**	**Method**	**Limit[2]**	**Units**								
Volatile Organic Compounds												
1,1,1-Trichloroethane	Air Toxics	TO-15SIM	**110,400**	ppbv	0.033 U	0.028 U	1.7 U	0.032 U	0.045 U	0.031 U	0.13 U	0.03 U
1,1-Dichloroethane	Air Toxics	TO-15SIM	**74**	ppbv	0.033 U	0.028 U	1.7 U	0.032 U	0.045 U	0.031 U	0.13 U	0.03 U
1,1-Dichloroethene	Air Toxics	TO-15SIM	**133,700**	ppbv	**0.084**	0.014 U	0.85 U	**0.078**	0.023 U	**0.23**	0.063 U	**0.29**
1,2,4-Trimethylbenzene*	EPA Region 9 Lab	TO-15	**NL**	ppbv	1.4 U	14 U	1.4 U	1.3 U	3 U	1.3 U	1.3 U	1.4 U
1,4-Dioxane*	EPA Region 9 Lab	TO-15	**8.4**	ppbv	1.4 U	14 UJ	1.4 U	1.3 U	3 U	1.3 U	1.3 U	1.4 U
2-Butanone	Air Toxics	TO-15SIM	**--**	ppbv	**4.4**	**0.45**	**74**	0.16 U	**3.7**	0.16 U	**19**	**0.59**
Acetone	Air Toxics	TO-15SIM	**NL**	ppbv	**14**	**4**	**160**	0.81 U	**18**	0.78 U	**40**	**2.6**
Benzene	Air Toxics	TO-15SIM	**19**	ppbv	**0.23**	**0.16**	**5.2**	0.081 U	**0.17**	0.078 U	**0.62**	**0.092**
Bromomethane	Air Toxics	TO-15SIM	**--**	ppbv	**0.11**	0.071 U	4.2 U	0.081 U	0.11 U	0.078 U	0.32 U	0.076 U
Carbon disulfide*	EPA Region 9 Lab	TO-15	**116,100**	ppbv	**2.2 J**	14 U	1.4 U	1.3 U	**7.2**	1.3 U	1.3 U	**1.8 J**
Chloroethane	Air Toxics	TO-15SIM	**--**	ppbv	0.083 U	0.071 U	4.2 U	0.081 U	**0.36**	0.078 U	**2.2**	0.076 U
Chloroform	Air Toxics	TO-15SIM	**--**	ppbv	**1**	0.028 U	1.7 U	0.032 U	**1**	0.031 U	**0.73**	0.03 U
Chloromethane	Air Toxics	TO-15SIM	**--**	ppbv	0.083 U	**0.24**	4.2 U	**0.1**	**0.47**	**0.11**	**0.73**	**0.11**
cis-1,2-Dichloroethene	Air Toxics	TO-15SIM	**NL**	ppbv	0.033 U	0.028 U	1.7 U	0.032 U	0.045 U	0.031 U	0.13 U	0.03 U
Dichlorodifluoromethane	Air Toxics	TO-15SIM	**--**	ppbv	**0.11**	**0.035**	1.7 U	0.032 U	**0.13**	0.031 U	**0.14**	0.03 U
Ethylbenzene	Air Toxics	TO-15SIM	**124,800**	ppbv	**0.13**	**0.035**	1.7 U	0.032 U	**0.11**	**0.031**	**0.15**	0.03 U
Hexachloro-1,3-butadiene*	EPA Region 9 Lab	TO-15	**NL**	ppbv	1.4 U	14 U	1.4 U	1.3 U	3 U	1.3 U	1.3 U	1.4 U
Methylene chloride	Air Toxics	TO-15SIM	**--**	ppbv	**0.72**	0.28 U	**21**	0.32 U	0.45 U	0.31 U	1.3 U	0.3 U
n-Hexane	Air Toxics	TO-15SIM	**--**	ppbv	**0.18**	0.14 U	8.5 U	0.16 U	**1.6**	0.16 U	**5.3**	0.15 U
Styrene	Air Toxics	TO-15SIM	**--**	ppbv	**0.45**	0.028 U	1.7 U	0.032 U	**0.23**	**0.14**	**0.3**	0.03 U
Tert-Butyl Methyl Ether	Air Toxics	TO-15SIM	**67**	ppbv	0.17 U	0.14 U	8.5 U	0.16 U	0.23 U	0.16 U	0.63 U	0.15 U
Tetrachloroethene	Air Toxics	TO-15SIM	**24**	ppbv	**2.4**	0.028 U	1.7 U	0.032 U	0.045 U	0.031 U	0.13 U	0.03 U
Toluene	Air Toxics	TO-15SIM	**143,900**	ppbv	**2.4**	**8.6**	**840**	**0.065**	**13**	**0.084**	**91**	**0.36**
trans-1,2-Dichloroethene	Air Toxics	TO-15SIM	**NL**	ppbv	0.17 U	0.14 U	8.5 U	0.16 U	0.23 U	0.16 U	0.63 U	0.15 U
Trichloroethene	Air Toxics	TO-15SIM	**110**	ppbv	**0.37**	**0.064**	0.26 U	0.0049 U	**0.046**	0.0046 U	**0.046**	**0.0056**
Trichlorofluoromethane	Air Toxics	TO-15SIM	**--**	ppbv	**0.23**	**0.042**	1.7 U	**0.043**	**0.094**	**0.05**	0.13 U	**0.036**
Vinyl chloride	Air Toxics	TO-15SIM	**31**	ppbv	**0.058**	0.014 U	0.85 U	0.016 U	0.023 U	0.016 U	0.063 U	**0.022**
Xylenes (total)	Air Toxics	TO-15SIM	**124,800**	ppbv	**0.58**	**0.098**	5.1 U	0.097 U	**0.6**	**0.32**	**0.77**	0.091 U
Total VOCs	Air Toxics	TO-15SIM	**55**	lbs/day	**5.96E-03**	**3.50E-03**	**1.14E-01**	**3.10E-05**	**5.36E-03**	**1.23E-04**	**4.12E-02**	**8.29E-04**
Dioxins and furans	Vista	CARB 428	**2.00E-04****	µg TEQ/dscm	1.38E-06	4.19E-06	1.07E-06	1.49E-06	1.53E-06	5.92E-07	2.18E-06	1.67E-06

Notes:

1 - Air Toxics - Air Toxics Ltd. is located in Folsom, CA.
EPA Region 9 Lab - the EPA Region 9 Laboratory is located in Richmond, CA.
Vista - Vista Analytical Laboratory is located in El Dorado Hills, CA.

2 - Limits are based on the results of the Tier 2 Screening Risk Assessment; only anaytes with limits are listed in this table. See Appendix 5 for vapor discharge permit details.

* Analytes were not included in the TO-15SIM list and therefore the analytical results for samples collected from SP-104/SP-109 and analyzed by TO-15 were used .

** - Dioxin and furan NESHAP limit is presented for the purpose of comparison. NESHAP is not a regulatory standard for the Pemaco Treatment Plant.

The TO-15 results reported are from the day on or before samples were collected from SP-104a and SP-109a and analyzed by TO-15SIM.

Bolded results indicate positive detections.

FTO - flameless thermal oxidizer; GAC - granular activated carbon; NESHAP - National Emission Standards for Hazardous Air Pollutants; NL - no limit; SIM - selective ion mode; TEQ - toxic equivalent;
VOCs- volatile organic compounds

U - not detected above the stated reporting limit; J - quantitative estimate; UJ - not detected at estimated reporting limit

"--" - not available

µg TEQ/dscm - microgram of TEQ per dry standard cubic meter; lbs/day - pounds per day; ppbv - part per billion by volume

Table 3.15
Destruction and Removal Efficiency for the Vapor Treatment System
Pemaco Superfund Site, Maywood, CA

		Station ID:	**SP-102**	**SP-104a**		**SP-109a**		**SP-102**	**SP-104a**		**SP-109a**		**SP-102**	**SP-104a**		**SP-109a**		**SP-102**	**SP-104a**		**SP-109a**	
		Description:	Pre-FTO	Post-FTO	**DRE[5] (%)**	Post-GAC	**DRE[5] (%)**	Pre-FTO	Post-FTO	**DRE[5] (%)**	Post-GAC	**DRE[5] (%)**	Pre-FTO	Post-FTO	**DRE[5] (%)**	Post-GAC	**DRE[5] (%)**	Pre-FTO	Post-FTO	**DRE[5] (%)**	Post-GAC	**DRE[5] (%)**
		Analysis Method[1]:	TO-15	TO-15SIM		TO-15SIM		TO-15	TO-15SIM		TO-15SIM		TO-15	TO-15SIM		TO-15SIM		TO-15	TO-15SIM		TO-15SIM	
		Laboratory[2]:	EPA Region 9	Air Toxics		Air Toxics		EPA Region 9	Air Toxics		Air Toxics		EPA Region 9	Air Toxics		Air Toxics		EPA Region 9	Air Toxics		Air Toxics	
		Date:	9/5/2007					9/18/2007					10/4/2007					11/15/2007				
Analyte	**Limit[3]**	**Units**																				
Volatile Organic Compounds																						
1,1-Dichloroethene	**133,700**	ppbv	**100**	**0.084**	99.9160	0.014 U	100.0000	270 U	0.85 U	NA	**0.078**	NC	270 U	0.023 U	NA	**0.23**	NC	240 U	0.063 U	NA	**0.29**	NC
2-Butanone	**--**	ppbv	**42**	**4.4**	89.5238	**0.45**	98.9286	270 UJ	**74**	NC	0.16 U	NA	270 UJ	**3.7**	NC	0.16 U	NA	240 UJ	**19**	NC	**0.59**	NC
Acetone	**NL**	ppbv	**33 J**	**14**	57.5758	**4**	87.8788	270 U	**160**	NC	0.81 U	NA	270 U	**18**	NC	0.78 U	NA	240 U	**40**	NC	**2.6**	NC
Benzene	**19**	ppbv	**190**	**0.23**	99.8789	**0.16**	99.9158	**620**	**5.2**	99.1613	0.081 U	100.0000	**680**	**0.17**	99.9750	0.078 U	100.0000	240 U	**0.62**	NC	**0.092**	NC
Bromomethane	**--**	ppbv	14 U	**0.11**	NC	0.071 U	NA	270 U	4.2 U	NA	0.081 U	NA	270 U	0.11 U	NA	0.078 U	NA	240 UJ	0.32 U	NA	0.076 U	NA
Chloroethane	**--**	ppbv	14 U	0.083 U	NA	0.071 U	NA	270 U	4.2 U	NA	0.081 U	NA	270 U	**0.36**	NC	0.078 U	NA	240 U	**2.2**	NC	0.076 U	NA
Chloroform	**--**	ppbv	**39**	**1**	97.4359	0.028 U	100.0000	270 U	1.7 U	NA	0.032 U	NA	270 U	**1**	NC	0.031 U	NA	240 U	**0.73**	NC	0.03 U	NA
Chloromethane	**--**	ppbv	14 U	0.083 U	NA	**0.24**	NC	270 U	4.2 U	NA	**0.1**	NC	270 UJ	**0.47**	NC	**0.11**	NC	240 U	**0.73**	NC	**0.11**	NC
cis- 1,2-Dichloroethene	**NL**	ppbv	**320**	0.033 U	100.0000	0.028 U	100.0000	**1,700**	1.7 U	100.0000	0.032 U	100.0000	**1,200**	0.045 U	100.0000	0.031 U	100.0000	**290 J**	0.13 U	100.0000	0.03 U	100.0000
Dichlorodifluoromethane	**--**	ppbv	14 U	**0.11**	NC	**0.035**	NC	270 U	1.7 U	NA	0.032 U	NA	270 UJ	**0.13**	NC	0.031 U	NA	240 UJ	**0.14**	NC	0.03 U	NA
Ethylbenzene	**124,800**	ppbv	**21 J**	**0.13**	99.3810	**0.035**	99.8333	270 U	1.7 U	NA	0.032 U	NA	270 UJ	**0.11**	NC	**0.031**	NC	240 U	**0.15**	NC	0.03 U	NA
Methylene chloride	**--**	ppbv	14 U	**0.72**	NC	0.28 U	NA	270 U	**21**	NC	0.32 U	NA	270 U	0.45 U	NA	0.31 U	NA	240 U	1.3 U	NA	0.3 U	NA
n-Hexane	**--**	ppbv	**42,000**	**0.18**	99.9996	0.14 U	100.0000	**86,000**	8.5 U	100.0000	0.16 U	100.0000	**130,000 J**	**1.6**	99.9988	0.16 U	100.0000	**44,000**	**5.3**	99.9880	0.15 U	100.0000
Styrene	**--**	ppbv	14 U	**0.45**	NC	0.028 U	NA	270 U	1.7 U	NA	0.032 U	NA	270 U	**0.23**	NC	**0.14**	NC	240 U	**0.3**	NC	0.03 U	NA
Tetrachloroethene	**24**	ppbv	**26 J**	**2.4**	90.7692	0.028 U	100.0000	270 U	1.7 U	NA	0.032 U	NA	270 U	0.045 U	NA	0.031 U	NA	240 U	0.13 U	NA	0.03 U	NA
Toluene	**143,900**	ppbv	**11,000**	**2.4**	99.9782	**8.6**	99.9218	**20,000**	**840**	95.8000	**0.065**	99.9997	**35,000**	**13**	99.9629	**0.084**	99.9998	**4,700**	**91**	98.0638	**0.36**	99.9923
Trichloroethene	**110**	ppbv	**600**	**0.37**	NC	**0.064**	99.9893	**1,900**	0.26 U	100.0000	0.0049 U	100.0000	**1,200**	**0.046**	99.9962	0.0046 U	100.0000	**1,100**	**0.046**	99.9958	**0.0056**	99.9995
Trichlorofluoromethane	**--**	ppbv	14 U	**0.23**	NC	**0.042**	NC	270 U	1.7 U	NA	**0.043**	NC	270 U	**0.094**	NC	**0.05**	NC	240 U	0.13 U	NA	**0.036**	NC
Vinyl chloride	**31**	ppbv	**27 J**	**0.058**	99.7852	0.014 U	100.0000	270 U	0.85 U	NA	0.016 U	NA	270 U	0.023 U	NA	0.016 U	NA	240 U	0.063 U	NA	**0.022**	NC
Xylenes (total)	**124,800**	ppbv	**98 J**	**0.58**	99.4082	**0.098**	99.9000	540 U	5.1 U	NA	0.097 U	NA	540 U	**0.6**	NC	**0.32**	NC	490 U	**0.77**	NC	0.091 U	NA
Total VOCs[4]	**55**	lbs/day	**45**	**5.96E-03**	99.9868	**3.50E-03**	99.9922	**29**	**1.14E-01**	99.6098	**3.10E-05**	99.9999	**88**	**5.36E-03**	99.9939	**1.23E-04**	99.9999	**31**	**4.12E-02**	99.8668	**8.29E-04**	99.9973

Notes:
1 - Only analytes that were positively detected are listed in this table. Detection limits are lower for TO-15SIM than for TO-15 and therefore some DREs could not be calculated.
2 - Air Toxics - Air Toxics Ltd. is located in Folsom, CA.
EPA Region 9 Lab - the EPA Region 9 Laboratory is located in Richmond, CA.
3 - Limits for individual analytes are based on the results of the Tier 2 Screening Risk Assessment; only anaytes with limits are listed in this table. See Appendix 5 for vapor discharge permit details.
4 - Total VOCs are based on the analytical results from samples collected from SP-104a and SP-109a for analysis by TO-15SIM only. Lighthydrocarbons and tentatively identified compounds are not included in this analysis.
5 - DREs are calculated only for TO-15SIM analytes.
Bolded results indicate positive detections.
DRE - destruction and removal efficiency
FTO - flameless thermal oxidizer
GAC - granular activated carbon
NA - not applicable
NC - not calculated
NL - no limit
SIM - selective ion mode
VOCs- volatile organic compounds
U - not detected above the stated reporting limit; J - quantitative estimate; UJ - not detected at estimated reporting limit
"--" - not available
lbs/day - pounds per day
ppbv - part per billion by volume

Table 4.1
Groundwater Extraction Well Field and Manifold Sampling Data
Pemaco Superfund Site, Maywood, CA

Manifold	Well ID	Well Field Data			
		Average Air Regulator Pressure (psi)	Minimum Flow Rate (gpd)	Maximum Flow Rate (gpd)	Average Flow Rate (gpd)
GW-1	DAB-01	60	462.6	6,834	2,837
	DAB-02	61	1401.4	7,284	5,344
	DAB-03	61	0.4	2,815	1,612
	DAB-04	64	0.0	950	458
	DAB-05	61	549.6	2,668	1,230
	DAB-06	59	0.0	1,577	498
	DAB-07	60	1489.3	4,833	2,776
GW-2	DAB-08	65	0.0	3,480	1,424
	DA-01	62	0.3	1,529	240
	DA-02	63	0.1	593	110
	DA-03	68	3.0	1,602	423
	DA-04	Closed			
	DA-05	Closed			
	DA-06	59	0.0	210	19
	DA-07	Closed			
	DB-01	67	354.8	4,261	1,820
	DB-02	60	176.2	686	293
	DB-03	70	0.0	874	369
	DB-04	60	0.0	1,718	562
	DB-05	60	0.0	4,875	1,756
	DB-06	60	14.0	1,042	430
	DB-07	60	4.0	3,073	1,063
GW-3	DA-08	58	0.0	7	1
	DA-09	69	0.0	10	1
	DA-10	Closed			
	DA-11	66	0.0	237	18
	DA-12	63	0.0	521	79
	DB-08	58	0.0	12,091	2,470
	DB-09	65	0.0	8,875	1,668
	DB-10	63	0.0	3,325	1,353
	DB-11	63	0.0	2,756	1,220
	DB-12	63	0.0	4,830	3,064
	MW-24-110	66	406.5	10,590	7,572

Totalizer ID	Water Treatment System Data			
	Minimum Flow Rate (gpd)	Maximum Flow Rate (gpd)	Average Flow Rate (gpd)	Cumulative Volume (gallons)
FQI-201	65	6,852	1,512	306,150
FQI-501	1	15,329	4,202	804,501
FQI-401	490	60,632	33,464	8,079,066
FQI-402	1,440	104,153	48,872	11,460,978

Notes:

1 - Averages, minima, and maxima were calculated using all field data that was collected in 2007 when well was operational.

FQI-201 measures flow from non-contact water from the vapor conditioning unit.

FQI-501 measures flow from the moisture separator.

FQI-401 measures flow from all groundwater manifolds.

FQI-402 measures flow into the final holding tank prior to discharge.

gpd - gallons per day; psi - pounds per square inch

Table 4.2
Groundwater Sampling Ports
Pemaco Superfund Site, Maywood, CA

Station ID	Monitoring Location	Analyte or Parameter	Laboratory[1]	Purpose of Data Collection; Data Use
SP-201	From Wells, post-GW Booster Tank (T-401)	VOCs by EPA 8260B	Calscience	Extraction/Treatment system optimization; estimate of mass removal rates
		1,4-Dioxane by EPA 8270C		
SP-204	Post-condensate sump (T-201) and post-Holding Tank (T-402)	VOCs by EPA 8260B	Calscience	To determine mass removal
		1,4-Dioxane by EPA 8270C		
SP-206	Post-carbon absorber (T-403)	VOCs by EPA 8260B	Calscience	To determine carbon break-through and mass removal
		1,4-Dioxane by EPA 8270C		
SP-208	Post-carbon absorber (T-404)	VOCs by EPA 8260B	Calscience	To determine carbon break-through and mass removal
		1,4-Dioxane by EPA 8270C		
SP-209	Prior to discharge to the sanitary sewer	COD, TSS and Lead (24-hour composite)	Calscience	To evaluate compliance with the Self-Monitoring Requirements Permit No. 16961 issued by the SDLAC
		pH, Dissolved Sulfide, Oil & Grease, VOCs and SVOCs	Calscience	
SP-210	From Moisture Separator (SP-117); Pre-Bag Filter (F-105/F-106)	VOCs by EPA 8260B	Calscience	Treatment system monitoring
SP-212	From FTO vapor conditioning (H-101); pre-Holding Tank (SP-113) or bypass to discharge	VOCs by EPA 8260B	Calscience	To determine mass removal
SP-213	From Exposition Wells South Trench DAB-1 to DAB-7 (7 wells)	VOCs by EPA 8260B	Calscience	Extraction system optimization; estimate of mass removal rates
SP-214	From Exposition Wells West Trench DAB-8, DA/DB-1 to DA/DB-7 (15 wells)	VOCs by EPA 8260B	Calscience	Extraction system optimization; estimate of mass removal rates
SP-215	From Exposition Wells East Trench DA/DB-8 to DA/DB-12 & MW24-140 (11 wells)	VOCs by EPA 8260B	Calscience	Extraction system optimization; estimate of mass removal rates

Notes:
1 - Calscience - Calscience Environmental Laboratory, Inc. is located in Garden Grove, CA.
SDLAC - Sanitation District of Los Angeles County
SVOCs - semi-volatile organic compounds
TDS - total dissolved solids
VOCs - volatile organic compounds

Table 4.3
VOC Analytical Results for the Groundwater Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Analyte: Units	1,1-DCA	1,1-DCE	1,4-Dioxane	2-Butanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chloroform	*cis*-1,2-DCE	Dibromochloromethane	Dibromomethane	n-Hexane	Tetrachloroethene	Toluene	*trans*-1,2-DCE	Trichloroethene	Vinyl chloride
SP-213	GW-1 Manifold	5/3/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**10**	**3.6**	1 U	1 U	--	1 U	1 U	1 U	**28**	0.5 U
		5/17/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**20**	**4**	1 U	1 U	--	1 U	1 U	1 U	**32**	0.5 U
		6/1/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**17**	**4.8**	1 U	1 U	--	1 U	1 U	1 U	**40**	0.5 U
		6/15/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**19**	**4.8**	1 U	1 U	--	1 U	1 U	1 U	**41**	0.5 U
		7/11/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**12**	**3.9**	1 U	1 U	--	1 U	1 U	1 U	**37**	0.5 U
		7/26/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**13**	**5.7**	1 U	1 U	--	1 U	1 U	1 U	**46**	0.5 U
		8/8/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**8.5**	**5.8**	1 U	1 U	--	1 U	1 U	1 U	**38**	0.5 U
		8/17/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**9.8**	**3.9**	1 U	1 U	1 U	1 U	1 U	1 U	**27**	0.5 U
		8/21/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4.1**	**4.7**	1 U	1 U	--	1 U	1 U	1 U	**35**	0.5 U
		8/28/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**6.3**	**3.7**	1 U	1 U	1 U	1 U	1 U	1 U	**33**	0.5 U
		9/4/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**7.9**	**5.7**	1 U	1 U	1 U	1 U	1 U	1 U	**38**	0.5 U
		9/12/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**6.7**	**4.9**	1 U	1 U	1 U	1 U	1 U	1 U	**41**	0.5 U
		9/19/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**6**	**4.6**	1 U	1 U	1 U	1 U	1 U	1 U	**40**	0.5 U
		9/26/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**2.5**	**5**	1 U	1 U	1 U	1 U	1 U	1 U	**34**	0.5 U
		10/5/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5.4**	**5.3**	1 U	1 U	1 U	1 U	1 U	1 U	**48**	0.5 U
		10/9/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**11**	**6.3**	1 U	1 U	1 U	1 U	1 U	1 U	**45**	0.5 U
		10/18/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**17**	**5.7**	1 U	1 U	**1.3**	1 U	1 U	1 U	**47**	0.5 U
		10/24/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5.2**	**4.9**	1 U	1 U	1 U	1 U	1 U	1 U	**35**	0.5 U
		11/2/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4.6**	**3.8**	1 U	1 U	1 U	1 U	1 U	1 U	**31**	0.5 U
		11/8/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**11**	**4.9**	1 U	1 U	1 U	1 U	1 U	1 U	**38**	0.5 U
		11/16/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**12**	**7**	1 U	1 U	1 U	1 U	1 U	1 U	**51**	0.5 U
		11/19/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**8.4**	**4.9**	1 U	1 U	1 U	1 U	1 U	1 U	**33**	0.5 U
		11/30/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5.6**	**5.5**	1 U	1 U	--	1 U	1 U	1 U	**34**	0.5 U
		12/5/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**9.9**	**5.2**	1 U	1 U	--	1 U	1 U	1 U	**46**	0.5 U
		12/12/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**8.8**	**5.5**	1 U	1 U	--	1 U	1 U	1 U	**37**	0.5 U
		12/19/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4**	**4.3**	1 U	1 U	--	1 U	1 U	1 U	**32**	0.5 U
		12/28/2007	µg/L	1 U	1 U	--	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**7.1**	**3.5**	1 U	1 U	--	1 U	1 U	1 U	**37**	0.5 U

Table 4.3
VOC Analytical Results for the Groundwater Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Analyte: Units	1,1-DCA	1,1-DCE	1,4-Dioxane	2-Butanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chloroform	*cis*-1,2-DCE	Dibromochloromethane	Dibromomethane	n-Hexane	Tetrachloroethene	Toluene	*trans*-1,2-DCE	Trichloroethene	Vinyl chloride
SP-214	GW-2 Manifold	5/3/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	**15**	**97**	10 U	10 U	--	10 U	10 U	10 U	**1,100**	5 U
		5/17/2007	µg/L	**6.1**	**2.1**	50 U	10 U	50 U	**6.3**	1 U	1 U	0.5 U	**16**	**130**	1 U	1 U	--	**2.2**	**3.4**	**4.9**	**1,100**	**1.1**
		6/1/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	**16**	**56**	10 U	10 U	--	10 U	10 U	10 U	**620**	5 U
		6/15/2007	µg/L	**7**	2 U	100 U	20 U	100 U	**4.4**	2 U	2 U	1 U	**8.8**	**45**	2 U	2 U	--	2 U	2 U	**2.1**	**350**	1 U
		7/11/2007	µg/L	**3.4**	2 U	100 U	20 U	100 U	**2.3**	2 U	2 U	1 U	**17**	**43**	2 U	2 U	--	2 U	2 U	2 U	**480**	1 U
		7/26/2007	µg/L	5 U	5 U	250 U	50 U	250 U	**3.2**	5 U	5 U	2.5 U	**24**	**56**	5 U	5 U	--	5 U	5 U	5 U	**550**	2.5 U
		8/8/2007	µg/L	**5.6**	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**15**	**43**	5 U	5 U	--	5 U	5 U	5 U	**420**	2.5 U
		8/17/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**19**	**45**	5 U	5 U	5 U	5 U	5 U	5 U	**420**	2.5 U
		8/21/2007	µg/L	5 U	5 U	250 U	50 U	250 U	**2.7**	5 U	5 U	2.5 U	**13**	**50**	5 U	5 U	--	5 U	5 U	5 U	**520**	2.5 U
		8/28/2007	µg/L	**3.7**	2 U	100 U	20 U	100 U	**2.1**	2 U	2 U	1 U	**18**	**50**	2 U	2 U	2 U	2 U	2 U	**2.3**	**380**	1 U
		9/4/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**15**	**42**	5 U	5 U	5 U	5 U	5 U	5 U	**460**	2.5 U
		9/12/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**10**	**29**	5 U	5 U	5 U	5 U	5 U	5 U	**260**	2.5 U
		9/19/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**15**	**39**	5 U	5 U	5 U	5 U	5 U	5 U	**430**	2.5 U
		9/26/2007	µg/L	**5.3**	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**11**	**39**	5 U	5 U	5 U	5 U	5 U	5 U	**320**	2.5 U
		10/5/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**12**	**47**	5 U	5 U	5 U	5 U	5 U	5 U	**500**	2.5 U
		10/9/2007	µg/L	**4**	2 U	100 U	20 U	100 U	**1.9**	2 U	2 U	1 U	**12**	**46**	2 U	2 U	2 U	2 U	2 U	**2.4**	**330**	1 U
		10/18/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**12**	**36**	5 U	5 U	**7.1**	5 U	5 U	5 U	**550**	2.5 U
		10/24/2007	µg/L	**5.4**	2 U	100 U	20 U	100 U	**1.4**	2 U	2 U	1 U	**17**	**34**	2 U	2 U	2 U	2 U	2 U	**2.1**	**240**	1 U
		11/2/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**63**	10 U	10 U	10 U	10 U	10 U	10 U	**1,000**	**6.2**
		11/8/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**72**	10 U	10 U	10 U	10 U	10 U	10 U	**650**	**5**
		11/16/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**12**	**290**	5 U	5 U	5 U	5 U	5 U	5 U	**520**	**5.4**
		11/19/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**7.1**	**76**	5 U	5 U	5 U	5 U	5 U	5 U	**700**	**3.9**
		11/30/2007	µg/L	**5.8**	5 U	--	50 U	250 U	**2.7**	5 U	5 U	2.5 U	**8.4**	**110**	5 U	5 U	--	5 U	5 U	**6.6**	**530**	**5.2**
		12/5/2007	µg/L	**4.7**	**2**	--	**27**	250 U	**2.5**	1 U	1 U	0.5 U	**7.5**	**190**	1 U	1 U	--	**1.3**	1 U	**3.5**	**610**	**7.4**
		12/12/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**7.9**	**120**	5 U	5 U	--	5 U	5 U	5 U	**430**	**4.8**
		12/19/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	5 U	**120**	5 U	5 U	--	5 U	5 U	5 U	**380**	**5.1**
		12/28/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	5 U	**89**	5 U	5 U	--	5 U	5 U	5 U	**430**	**3.2**

Table 4.3
VOC Analytical Results for the Groundwater Extraction Manifold
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Analyte: Units	1,1-DCA	1,1-DCE	1,4-Dioxane	2-Butanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chloroform	*cis*-1,2-DCE	Dibromochloromethane	Dibromomethane	n-Hexane	Tetrachloroethene	Toluene	*trans*-1,2-DCE	Trichloroethene	Vinyl chloride
SP-215	GW-3 Manifold	5/3/2007	µg/L	**2.8**	**2.5**	50 U	10 U	50 U	**0.6**	1 U	1 U	0.5 U	**2.9**	**48**	1 U	1 U	--	**1.8**	1 U	**2**	**1,200**	**1.8**
		5/17/2007	µg/L	**4.4**	**1.7**	50 U	10 U	50 U	**0.86**	1 U	1 U	0.5 U	**1.2**	**24**	1 U	1 U	--	1 U	1 U	**1.3**	**190**	**0.52**
		6/1/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**34**	10 U	10 U	--	10 U	10 U	10 U	**1,200**	5 U
		6/15/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**49**	10 U	10 U	--	10 U	10 U	10 U	**1,800**	5 U
		7/11/2007	µg/L	20 U	20 U	1,000 U	200 U	1,000 U	10 U	20 U	20 U	10 U	20 U	**28**	20 U	20 U	--	20 U	20 U	20 U	**910**	10 U
		7/26/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**34**	10 U	10 U	--	10 U	10 U	10 U	**1,200**	5 U
		8/8/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**170**	10 U	10 U	--	10 U	10 U	10 U	**1,700**	**7.1**
		8/17/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**120**	10 U	10 U	10 U	10 U	10 U	10 U	**1,300**	5 U
		8/21/2007	µg/L	20 U	20 U	1,000 U	200 U	1,000 U	10 U	20 U	20 U	10 U	20 U	**230**	20 U	20 U	--	20 U	20 U	20 U	**2,200**	**12**
		8/28/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**240**	10 U	10 U	10 U	10 U	10 U	10 U	**1,500**	**10**
		9/4/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**390**	10 U	10 U	10 U	10 U	10 U	10 U	**990**	**7.9**
		9/12/2007	µg/L	10 U	10 U	500 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**74**	10 U	10 U	10 U	10 U	**100**	10 U	**270**	5 U
		9/19/2007	µg/L	10 U	10 U	--	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**300**	10 U	10 U	10 U	10 U	**12**	10 U	**1,400**	**9**
		9/26/2007	µg/L	10 U	10 U	--	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**260**	10 U	10 U	10 U	10 U	10 U	10 U	**960**	**7.9**
		10/5/2007	µg/L	5 U	5 U	250 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	5 U	**390**	5 U	5 U	5 U	5 U	5 U	5 U	**180**	**6.4**
		10/9/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.1**	**3.9**	1 U	1 U	1 U	1 U	1 U	1 U	**47**	0.5 U
		10/18/2007	µg/L	2 U	2 U	--	20 U	100 U	1 U	2 U	2 U	1 U	2 U	**210**	2 U	2 U	**2.8**	2 U	2 U	2 U	**160**	**4.1**
		10/24/2007	µg/L	**1**	**1.5**	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**210**	1 U	1 U	1 U	1 U	**1.6**	**1.7**	**130**	**4**
		11/2/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**3.7**	1 U	1 U	1 U	1 U	**7.5**	1 U	**16**	0.5 U
		11/8/2007	µg/L	1 U	1 U	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**9**	1 U	1 U	1 U	1 U	**5.6**	1 U	**50**	**1.1**
		11/16/2007	µg/L	1 U	**1.8**	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.3**	**150**	1 U	1 U	**1.1**	1 U	1 U	**1.5**	**120**	**2.5**
		11/19/2007	µg/L	1 U	**2.2**	50 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**130**	1 U	1 U	1 U	1 U	1 U	**1.7**	**260**	**4.7**
		11/30/2007	µg/L	10 U	10 U	--	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**81**	10 U	10 U	--	10 U	10 U	10 U	**1,500**	**8.2**
		12/5/2007	µg/L	1 U	**1.3**	--	10 U	**94**	**0.5**	1 U	1 U	0.5 U	1 U	**35**	1 U	1 U	--	1 U	**7.9**	**1.3**	**1,300**	**2.4**
		12/12/2007	µg/L	10 U	10 U	--	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**46**	10 U	10 U	--	10 U	10 U	10 U	**530**	5 U
		12/19/2007	µg/L	10 U	10 U	--	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**21**	10 U	10 U	--	10 U	10 U	10 U	**640**	5 U
		12/28/2007	µg/L	5 U	5 U	--	50 U	250 U	2.5 U	5 U	5 U	2.5 U	5 U	**27**	5 U	5 U	--	5 U	5 U	5 U	**400**	2.5 U

Notes:
Analyses were performed by Calscience Environmental Laboratories, Inc. using EPA Method 8260B.
1,1-DCA - 1,1-dichloroethane; 1,1-DCE - 1,1-dichloroethene; *cis*-1,2-DCE - *cis*-1,2-dichloroethene; *trans*-1,2-DCE - *trans*-1,2-Dichloroethene
U - not detected above the stated reporting limit; UJ - not detected at estimated reporting limit; J - quantitative estimate
"--" - not available
µg/L - microgram per liter

Table 4.4
VOC Analytical Results for Groundwater Treatment System Samples
Pemaco Superfund Site, Maywood, CA

Station ID	Description	Date	Units	1,1-DCA	1,1-DCE	2-Butanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chloroform	*cis*-1,2-DCE	Dibromochloromethane	Dibromomethane	n-Hexane	Tetrachloroethene	Toluene	*trans*-1,2-DCE	Trichloroethene	Vinyl chloride	1,4-Dioxane
			Method:	EPA 8260B																		EPA 8270
SP-201	Influent	5/3/2007	µg/L	**2**	**1.5**	10 U	50 U	**1.4**	1 U	1 U	0.5 U	**9.3**	**44**	1 U	1 U	--	**1.2**	1 U	**2.1**	**670**	**0.88**	**5.5**
SP-204	Pre-GAC	5/3/2007	µg/L	**2**	**1.4**	10 U	50 U	**1.2**	1 U	1 U	0.5 U	**8.4**	**42**	1 U	1 U	--	**1.3**	1 U	**1.8**	**710**	**0.94**	50 U
SP-206	Post-Primary GAC	5/3/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**2.2**
SP-208	Post-Secondary GAC	5/3/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**2 U**
SP-204	Pre-GAC	5/10/2007	µg/L	10 U	10 U	100 U	500 U	5 U	10 U	10 U	5 U	10 U	**51**	10 U	10 U	--	10 U	10 U	10 U	**970**	5 U	**8.8**
SP-201	Influent	5/17/2007	µg/L	**3.3**	**1.2**	10 U	50 U	**2.4**	1 U	1 U	0.5 U	**17**	**59**	1 U	1 U	--	**1.1**	**1.4**	**2.3**	**550**	**0.63**	**10**
SP-204	Pre-GAC	5/18/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	1 U	0.5 U	**9.4**	**42**	5 U	5 U	--	5 U	**15**	5 U	**700**	2.5 U	250 U
SP-206	Post-Primary GAC	5/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	5 U	2.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**11**
SP-208	Post-Secondary GAC	5/17/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**4.1**
SP-210	Post-Moisture Seperator	5/18/2007	µg/L	1 U	1 U	10 U	50 U	**0.59**	1 U	1 U	0.5 U	1 U	**14**	1 U	1 U	--	1 U	1 U	1 U	**110**	0.5 U	50 U
SP-212	VCP Drainage	5/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	5/24/2007	µg/L	10 U	10 U	100 U	500 U	5 U	10 U	10 U	5 U	**14**	**32**	10 U	10 U	--	10 U	10 U	10 U	**560**	5 U	500 U
SP-212	VCP Drainage	5/24/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	6/1/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**8.8**	**27**	5 U	5 U	--	5 U	5 U	5 U	**610**	2.5 U	**100**
SP-204	Pre-GAC	6/1/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**7.4**	**24**	5 U	5 U	--	5 U	5 U	5 U	**490**	2.5 U	250 U
SP-206	Post-Primary GAC	6/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**2**	**2**	1 U	1 U	--	1 U	1 U	1 U	**5**	0.5 U	**72**
SP-208	Post-Secondary GAC	6/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**20**
SP-210	Post-Moisture Seperator	6/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**28**	1 U	1 U	--	**1**	1 U	**1.3**	**150**	0.5 U	50 U
SP-212	VCP Drainage	6/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	6/7/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**5.9**	**22**	5 U	5 U	--	5 U	5 U	5 U	**320**	2.5 U	250 U
SP-210	Post-Moisture Seperator	6/7/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**41**	1 U	1 U	--	1 U	**5**	**1.3**	**140**	0.5 U	50 U
SP-212	VCP Drainage	6/7/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	6/15/2007	µg/L	**1.6**	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**6.1**	**18**	1 U	1 U	--	1 U	1 U	1 U	**260**	0.5 U	**98**
SP-204	Pre-GAC	6/15/2007	µg/L	**1.3**	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5**	**16**	1 U	1 U	--	1 U	1 U	1 U	**190**	0.5 U	**62**
SP-206	Post-Primary GAC	6/15/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**3**	**4.5**	1 U	1 U	--	1 U	1 U	1 U	**6.7**	0.5 U	**72**
SP-208	Post-Secondary GAC	6/15/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**59**
SP-210	Post-Moisture Seperator	6/15/2007	µg/L	1 U	1 U	10 U	**82**	0.5 U	1 U	1 U	0.5 U	1 U	**31**	1 U	1 U	--	1 U	1 U	1 U	**79**	0.5 U	50 U
SP-212	VCP Drainage	6/15/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	6/20/2007	µg/L	**1.1**	**1.1**	10 U	**66**	0.5 U	1 U	1 U	0.5 U	**3.7**	**16**	1 U	1 U	--	**6.2**	1 U	1 U	**150**	0.5 U	**93**
SP-210	Post-Moisture Seperator	6/20/2007	µg/L	1 U	1 U	10 U	**160**	0.5 U	1 U	1 U	0.5 U	1 U	**28**	1 U	1 U	--	**4.1**	**22**	1 U	**66**	0.5 U	**66**
SP-212	VCP Drainage	6/20/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	**3**	1 U	1 U	**4.3**	0.5 U	50 U
SP-204	Pre-GAC	7/6/2007	µg/L	2 U	2 U	20 U	100 U	1 U	2 U	2 U	1 U	**9.2**	**13**	2 U	2 U	--	2 U	2 U	2 U	**170**	1 U	100 U
SP-210	Post-Moisture Seperator	7/6/2007	µg/L	2 U	2 U	20 U	**220**	1 U	2 U	2 U	1 U	2 U	**4.4**	2 U	2 U	--	2 U	**3.8**	2 U	**15**	1 U	100 U
SP-212	VCP Drainage	7/6/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	7/11/2007	µg/L	2 U	2 U	20 U	**100**	1 U	2 U	2 U	1 U	**4.7**	**17**	2 U	2 U	--	2 U	2 U	2 U	**230**	1 U	**82**
SP-204	Pre-GAC	7/11/2007	µg/L	**1**	1 U	10 U	**130**	**0.56**	1 U	1 U	0.5 U	**4.6**	**17**	1 U	1 U	--	1 U	**2.4**	1 U	**240**	0.5 U	**83**
SP-206	Post-Secondary GAC	7/11/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**14**
SP-208	Post-Primary GAC	7/11/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**48**
SP-210	Post-Moisture Seperator	7/11/2007	µg/L	1 U	1 U	10 U	**390**	0.5 U	1 U	1 U	0.5 U	1 U	**17**	1 U	1 U	--	1 U	**36**	1 U	**40**	0.5 U	**130**
SP-212	VCP Drainage	7/11/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	7/18/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**6.6**	**16**	5 U	5 U	--	5 U	5 U	5 U	**320**	2.5 U	250 U
SP-210	Post-Moisture Seperator	7/18/2007	µg/L	5 U	5 U	50 U	**310**	2.5 U	5 U	5 U	2.5 U	5 U	**16**	5 U	5 U	--	5 U	**56**	5 U	**33**	2.5 U	250 U
SP-212	VCP Drainage	7/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	7/26/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**9.4**	**23**	5 U	5 U	--	5 U	5 U	5 U	**490**	2.5 U	**9.7**
SP-204	Pre-GAC	7/26/2007	µg/L	2 U	2 U	20 U	100 U	1 U	2 U	**3.2**	1 U	**7.5**	**22**	2 U	2 U	--	2 U	**15**	2 U	**350**	1 U	100 U
SP-206	Post-Primary GAC	7/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	**5**	0.5 U	**24**
SP-208	Post-Secondary GAC	7/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**2.1**
SP-210	Post-Moisture Seperator	7/26/2007	µg/L	1 U	1 U	10 U	**200**	**0.74**	**1.4**	**6.3**	0.5 U	**1.3**	**15**	**4.1**	**1.4**	--	1 U	**52**	1 U	**30**	0.5 U	50 U
SP-212	VCP Drainage	7/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	8/1/2007	µg/L	2 U	2 U	20 U	**110**	1 U	2 U	2 U	1 U	**5.9**	**16**	2 U	2 U	--	2 U	**11**	2 U	**150**	1 U	100 U
SP-210	Post-Moisture Seperator	8/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**22**	1 U	1 U	--	1 U	1 U	1 U	**85**	0.5 U	50 U
SP-212	VCP Drainage	8/1/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	8/8/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**6.4**	**36**	5 U	5 U	--	5 U	**14**	5 U	**360**	2.5 U	**18**
SP-204	Pre-GAC	8/8/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**5.8**	**30**	5 U	5 U	--	5 U	**26**	5 U	**320**	2.5 U	250 U
SP-206	Post-Primary GAC	8/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**22**
SP-208	Post-Secondary GAC	8/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**18**
SP-210	Post-Moisture Seperator	8/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.4**	**9.9**	1 U	1 U	--	1 U	1 U	1 U	**38**	0.5 U	50 U
SP-212	VCP Drainage	8/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-204	Pre-GAC	8/15/2007	µg/L	1 U	1 U	10 U	50 U	**0.59**	1 U	5 U	2.5 U	**5.4**	**41**	1 U	1 U	1 U	1 U	**13**	1 U	**410**	**1.2**	50 U
SP-210	Post-Moisture Seperator	8/15/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**2.9**	1 U	1 U	1 U	1 U	1 U	1 U	**6.5**	0.5 U	50 U
SP-212	VCP Drainage	8/15/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	8/17/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	1 U	0.5 U	**9.9**	**50**	5 U	5 U	5 U	5 U	**6.1**	5 U	**550**	2.5 U	**31**
SP-206	Post-Primary GAC	8/17/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.5**	**1.1**	1 U	1 U	1 U	1 U	1 U	1 U	**1.2**	0.5 U	**34**
SP-208	Post-Secondary GAC	8/17/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**30**
SP-201	Influent	8/21/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**7.6**	**78**	5 U	5 U	--	5 U	5 U	5 U	**730**	**3.1**	**2.9**
SP-204	Pre-GAC	8/21/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**8.7**	2.5 U	**7.3**	**73**	5 U	5 U	--	5 U	5 U	5 U	**670**	**2.7**	250 U
SP-206	Post-Primary GAC	8/21/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.7**	**1.5**	1 U	1 U	--	1 U	1 U	1 U	**1.1**	**0.67**	**23**
SP-208	Post-Secondary GAC	8/21/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	**28**
SP-210	Post-Moisture Seperator	8/21/2007	µg/L	1 U	1 U	**11**	50 U	**1**	**4.1**	**5.6**	0.5 U	**11**	**5**	**5.6**	**1.9**	--	1 U	**59**	1 U	**7.4**	0.5 U	**72**
SP-212	VCP Drainage	8/21/2007	µg/L	1 U	1 U	**42**	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	8/28/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**8.7**	**89**	5 U	5 U	5 U	5 U	5 U	5 U	**610**	**3.1**	**7.4**
SP-204	Pre-GAC	8/28/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	**8.4**	**96**	5 U	5 U	5 U	5 U	5 U	5 U	**560**	2.5 U	250 U
SP-206	Post-Primary GAC	8/28/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**2.1**	**2.6**	1 U	1 U	1 U	1 U	1 U	1 U	**1.4**	**0.79**	**13**
SP-208	Post-Secondary GAC	8/28/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**23**
SP-210	Post-Moisture Seperator	8/28/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	**68**	**25**	2.5 U	**230**	5 U	**50**	**5.2**	5 U	5 U	**5.7**	5 U	**9.4**	2.5 U	250 U
SP-212	VCP Drainage	8/28/2007	µg/L	10 U	10 U	**510**	500 U	5 U	10 U	10 U	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U	500 U
SP-201	Influent	9/4/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**52**	2.5 U	**6.1**	**93**	**7.5**	5 U	5 U	5 U	**5.7**	5 U	**370**	2.5 U	**16**
SP-204	Pre-GAC	9/4/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**15**	2.5 U	**5**	**79**	5 U	5 U	5 U	5 U	**18**	5 U	**300**	2.5 U	250 U
SP-206	Post-Primary GAC	9/4/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**3.8**	**6.7**	1 U	1 U	1 U	1 U	1 U	1 U	**1.9**	**1.1**	**15**
SP-208	Post-Secondary GAC	9/4/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**20**
SP-210	Post-Moisture Seperator	9/4/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**3.6**	1 U	1 U	1 U	1 U	1 U	1 U	**5.5**	0.5 U	50 U
SP-212	VCP Drainage	9/4/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	9/12/2007	µg/L	1 U	**1.1**	10 U	50 U	**0.87**	1 U	**35**	0.5 U	**6**	**77**	**3.2**	1 U	1 U	1 U	**17**	1 U	**400**	**1.9**	**140**
SP-204	Pre-GAC	9/12/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**57**	2.5 U	**5.4**	**62**	**7.8**	5 U	5 U	5 U	**21**	5 U	**330**	2.5 U	250 U
SP-206	Post-Primary GAC	9/12/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	**2.1**	0.5 U	**3.9**	**11**	1 U	1 U	1 U	1 U	1 U	1 U	**9.1**	**0.78**	**150**
SP-208	Post-Secondary GAC	9/12/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**24**
SP-210	Post-Moisture Seperator	9/12/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.5**	**25**	1 U	1 U	1 U	1 U	**2.2**	1 U	**26**	0.5 U	**700**
SP-212	VCP Drainage	9/12/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	9/19/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**61**	2.5 U	5 U	**77**	**13**	5 U	5 U	5 U	**20**	5 U	**410**	2.5 U	**20**
SP-204	Pre-GAC	9/19/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**69**	2.5 U	5 U	**67**	**11**	5 U	5 U	5 U	**31**	5 U	**320**	2.5 U	--
SP-206	Post-Primary GAC	9/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	**2**	0.5 U	**3.9**	**14**	1 U	1 U	1 U	1 U	1 U	1 U	**9.6**	**1.1**	**54**
SP-208	Post-Secondary GAC	9/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**79**
SP-210	Post-Moisture Seperator	9/19/2007	µg/L	1 U	1 U	10 U	50 U	**6.1**	**25**	**29**	0.5 U	**14**	**28**	**41**	1 U	**4.7**	1 U	**300**	1 U	**19**	0.5 U	--
SP-212	VCP Drainage	9/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	9/26/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**18**	2.5 U	**5.3**	**110**	5 U	5 U	5 U	5 U	**10**	5 U	**450**	**2.9**	**7.5**
SP-204	Pre-GAC	9/26/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	**21**	2.5 U	5 U	**98**	5 U	5 U	5 U	5 U	**24**	5 U	**390**	2.5 U	--
SP-206	Post-Primary GAC	9/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4.2**	**17**	1 U	1 U	1 U	1 U	1 U	1 U	**5.8**	**1.2**	**27**
SP-208	Post-Secondary GAC	9/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**56**
SP-210	Post-Moisture Seperator	9/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**1.1**	**18**	1 U	1 U	1 U	1 U	1 U	1 U	**12**	0.5 U	--
SP-212	VCP Drainage	9/26/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	10/5/2007	µg/L	1 U	1 U	10 U	50 U	**0.69**	1 U	**49**	0.5 U	**6.6**	**130**	1 U	1 U	1 U	1 U	**8.3**	1 U	**180**	**1.9**	**6.5**
SP-204	Pre-GAC	10/5/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	**21**	0.5 U	**6**	**130**	1 U	1 U	1 U	1 U	**9.1**	1 U	**160**	**1.6**	50 U
SP-206	Post-Primary GAC	10/5/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4.4**	**18**	1 U	**1**	1 U	1 U	1 U	1 U	**4.6**	**1.1**	**11**
SP-208	Post-Secondary GAC	10/5/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	**33**
SP-210	Post-Moisture Seperator	10/5/2007	µg/L	1 U	1 U	**12**	50 U	**4.8**	**66**	**2.8**	**0.55**	**300**	**20**	**22**	1 U	1 U	1 U	**240**	1 U	**12**	0.5 U	50 U
SP-212	VCP Drainage	10/5/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	10/9/2007	µg/L	**1.1**	1 U	10 U	50 U	**0.8**	1 U	**7.4**	0.5 U	**7.1**	**96**	**1**	1 U	1 U	1 U	**8.1**	**1.4**	**130**	**1.4**	**6.2**
SP-204	Pre-GAC	10/9/2007	µg/L	**1.2**	1 U	10 U	50 U	**0.76**	1 U	**8.7**	0.5 U	**7.5**	**110**	**1.7**	1 U	1 U	1 U	**10**	**1.5**	**130**	**1.4**	50 U
SP-206	Post-Primary GAC	10/9/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**4.1**	**17**	1 U	**1.1**	1 U	1 U	1 U	1 U	**2.7**	**1.2**	**9.6**
SP-208	Post-Secondary GAC	10/9/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**0.52**	**27**
SP-210	Post-Moisture Seperator	10/9/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5.4**	**4.7**	1 U	1 U	1 U	1 U	1 U	1 U	**7.2**	0.5 U	50 U
SP-212	VCP Drainage	10/9/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	10/18/2007	µg/L	**1**	1 U	10 U	50 U	**0.72**	1 U	**3**	0.5 U	**4.7**	**57**	1 U	1 U	**1.5**	1 U	**5.2**	1 U	**110**	**0.96**	**6.2**
SP-204	Pre-GAC	10/18/2007	µg/L	**1.1**	1 U	10 U	50 U	**0.74**	1 U	**1.7**	0.5 U	**3.9**	**59**	1 U	1 U	**1.4**	1 U	**11**	1 U	**110**	**0.83**	--
SP-206	Post-Primary GAC	10/18/2007	µg/L	**1.2**	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	**5.3**	**20**	1 U	**1.5**	**1.4**	1 U	1 U	1 U	**1.6**	**0.96**	**7.2**
SP-208	Post-Secondary GAC	10/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	**1.4**	1 U	1 U	1 U	1 U	0.5 U	**17**
SP-210	Post-Moisture Seperator	10/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	**7.6**	1 U	1 U	**1.5**	1 U	1 U	1 U	**6.3**	0.5 U	--
SP-212	VCP Drainage	10/18/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	**1.5**	1 U	1 U	1 U	1 U	0.5 U	--

Table 4.4
VOC Analytical Results for Groundwater Treatment System Samples
Pemaco Superfund Site, Maywood, CA

			Analyte:	1,1-DCA	1,1-DCE	2-Butanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chloroform	*cis*-1,2-DCE	Dibromochloromethane	Dibromomethane	n-Hexane	Tetrachloroethene	Toluene	*trans*-1,2-DCE	Trichloroethene	Vinyl chloride	1,4-Dioxane
			Method:	EPA 8260B																		EPA 8270
Station ID	Description	Date	Units																			
SP-201	Influent	10/24/2007	µg/L	1.1	1 U	10 U	96	0.51	36	45	0.5 U	20	76	65	1 U	1 U	1 U	3.2	1.5	120	1.1	49
SP-204	Pre-GAC	10/24/2007	µg/L	1 U	1 U	10 U	50 U	0.75	1 U	11	0.5 U	3.8	70	1.9	1 U	1 U	1 U	18	1 U	92	0.81	63
SP-206	Post-Primary GAC	10/24/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	5.1	28	1 U	1.4	1 U	1 U	1 U	1 U	2.4	0.83	42
SP-208	Post-Secondary GAC	10/24/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	14
SP-210	Post-Moisture Seperator	10/24/2007	µg/L	1 U	1 U	10 U	50 U	1.2	1 U	1 U	0.5 U	1 U	10	1 U	1 U	1 U	1 U	29	1 U	11	0.5 U	81
SP-212	VCP Drainage	10/24/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	11/2/2007	µg/L	1 U	1	10 U	53	0.5 U	6.7	30	0.5 U	6.5	17	24	1 U	1 U	1 U	8.1	1 U	230	1.4	81
SP-204	Pre-GAC	11/2/2007	µg/L	2 U	2 U	20 U	100 U	1 U	2 U	71	1 U	5	19	14	2 U	2 U	2 U	8.1	2 U	250	1.4	100 U
SP-208	Post-Primary GAC	11/2/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.6	32
SP-210	Post-Moisture Seperator	11/2/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	3.8	1 U	1 U	1 U	1 U	1 U	1 U	8.9	0.5 U	50 U
SP-212	VCP Drainage	11/2/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	11/8/2007	µg/L	1 U	1 U	10 U	50 U	0.51	1 U	2	0.5 U	3.3	31	1.6	1 U	1 U	1 U	4.9	1 U	150	3.1	71
SP-204	Pre-GAC	11/8/2007	µg/L	1 U	1 U	10 U	50 U	0.53	1 U	4.4	0.5 U	3.7	25	1.7	1 U	1 U	1 U	5.7	1 U	130	1.7	82
SP-206	Post-Secondary GAC	11/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	6.5
SP-208	Post-Primary GAC	11/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.71	31
SP-210	Post-Moisture Seperator	11/8/2007	µg/L	1 U	1 U	35	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.4	0.5 U	200
SP-212	VCP Drainage	11/8/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	11/16/2007	µg/L	1.2	1 U	33	50 U	0.68	1 U	2.7	0.5 U	5.7	54	1 U	2.9	1	1 U	2.3	1.3	290	2.2	10
SP-204	Pre-GAC	11/16/2007	µg/L	1 U	1 U	10 U	56	0.55	1 U	2.7	0.5 U	4.6	40	1 U	2.2	1	1 U	5.6	1 U	230	1.6	9.8
SP-206	Post-Secondary GAC	11/16/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	26
SP-208	Post-Primary GAC	11/16/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.79	36
SP-210	Post-Moisture Seperator	11/16/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	3.1	1 U	1 U	1 U	1 U	1 U	1 U	7.7	0.5 U	50 U
SP-201	Influent	11/19/2007	µg/L	2 U	2 U	20 U	100 U	1 U	2 U	2 U	1 U	6.8	55	2 U	2 U	2 U	2 U	2 U	2 U	290	2.2	9.6
SP-204	Pre-GAC	11/19/2007	µg/L	2 U	2 U	20 U	100 U	1 U	4.8	12	1 U	10	54	9.4	2 U	2 U	2 U	2 U	2 U	250	1.5	10
SP-206	Post-Secondary GAC	11/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	28
SP-208	Post-Primary GAC	11/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.78	26
SP-210	Post-Moisture Seperator	11/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	2.4	1 U	1 U	1 U	1 U	1 U	1 U	7.8	0.5 U	50 U
SP-212	VCP Drainage	11/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	50 U
SP-201	Influent	11/30/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	40	2.5 U	5 U	35	5.2	5 U	--	5 U	6.4	5 U	470	2.5 U	73
SP-204	Pre-GAC	11/30/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	34	2.5 U	5 U	36	5.8	5 U	--	5 U	6	5 U	440	2.5 U	77
SP-208	Post-Secondary GAC	11/30/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	2 U
SP-210	Post-Moisture Seperator	11/30/2007	µg/L	1 U	1 U	15	300	0.65	69	6.9	0.5 U	120	3.7	51	1 U	--	1 U	42	1 U	8.6	0.5 U	--
SP-212	VCP Drainage	11/30/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	12/5/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	17	72	2.5 U	7.3	49	59	5 U	--	5 U	5 U	5 U	570	2.5 U	9.5
SP-204	Pre-GAC	12/5/2007	µg/L	1.1	1 U	10 U	110	0.55	17	140	0.5 U	7	45	63	1 U	--	1 U	2	1.2	490	1.8	10
SP-206	Post-Primary GAC	12/5/2007	µg/L	1 U	1 U	10 U	130	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	61
SP-208	Post-Secondary GAC	12/5/2007	µg/L	1 U	1 U	10 U	53	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	5.3
SP-210	Post-Moisture Seperator	12/5/2007	µg/L	2 U	2 U	20 U	200	1 U	56	5.8	1 U	83	3.5	36	2 U	--	2 U	32	2 U	9.8	1 U	--
SP-212	VCP Drainage	12/5/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	12/12/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	5 U	2.5 U	5 U	40	5 U	5 U	--	5 U	5 U	5 U	320	2.5 U	38
SP-204	Pre-GAC	12/12/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	11	2.5 U	5 U	34	5 U	5 U	--	5 U	5 U	5 U	260	2.5 U	41
SP-206	Post-Primary GAC	12/12/2007	µg/L	1 U	1 U	10 U	160	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	51
SP-208	Post-Secondary GAC	12/12/2007	µg/L	1 U	1 U	10 U	97	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	21
SP-210	Post-Moisture Seperator	12/12/2007	µg/L	2 U	2 U	20 U	360	1 U	69	4.8	1 U	130	4.3	45	2 U	--	2 U	27	2 U	12	1 U	--
SP-212	VCP Drainage	12/12/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	12/19/2007	µg/L	5 U	5 U	50 U	360	2.5 U	20	75	2.5 U	5.3	25	62	5 U	--	5 U	7.8	5 U	320	2.5 U	51
SP-204	Pre-GAC	12/19/2007	µg/L	5 U	5 U	50 U	250 U	2.5 U	5 U	62	2.5 U	5 U	25	18	5 U	--	5 U	7.3	5 U	260	2.5 U	46
SP-206	Post-Primary GAC	12/19/2007	µg/L	1 U	1 U	10 U	110	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.51	36
SP-208	Post-Secondary GAC	12/19/2007	µg/L	1 U	1 U	10 U	86	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	27
SP-210	Post-Moisture Seperator	12/19/2007	µg/L	1 U	1 U	10 U	93	0.5 U	1 U	1 U	0.5 U	1 U	2.5	1 U	1 U	--	1 U	1 U	1 U	10	0.5 U	--
SP-212	VCP Drainage	12/19/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	--
SP-201	Influent	12/28/2007	µg/L	2 U	2 U	20 U	100 U	1 U	2.8	150	1 U	4.8	44	17	2 U	--	2 U	2 U	2 U	330	2.6	21
SP-204	Pre-GAC	12/28/2007	µg/L	2 U	2 U	20 U	110	1 U	2 U	180	12	4	29	20	2 U	--	2 U	3.7	2 U	270	1.7	33
SP-206	Post-Primary GAC	12/28/2007	µg/L	1 U	1 U	10 U	110	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.82	39
SP-208	Post-Secondary GAC	12/28/2007	µg/L	1 U	1 U	10 U	85	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	33
SP-210	Post-Moisture Seperator	12/28/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	2.2	1 U	1 U	--	1 U	1 U	1 U	13	0.5 U	--
SP-212	VCP Drainage	12/28/2007	µg/L	1 U	1 U	10 U	50 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U	--	1 U	1 U	1 U	1 U	0.5 U	--

Notes:
Bolded results indicate positive detections.
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete lab reports, see Appendix 4.
Analyses were performed by Calscience Environmental Laboratories, Inc. located in Garden Grove, CA.
1,1-DCA - 1,1-dichloroethane; 1,1-DCE - 1,1-dichloroethene; *cis*-1,2-DCE - *cis*-1,2-dichloroethene; *trans*-1,2-DCE - *trans*-1,2-dichloroethene
GAC - granular activated carbon
VCP - vapor conditioning package
U - not detected above the stated reporting limit; UJ - not detected at estimated reporting limit; J - quantitative estimate
"--" - not available
µg/L - microgram per liter

Table 4.5
Groundwater Treatment System Performance
Pemaco Superfund Site, Maywood, CA

Month	Notes	Monthly Operating Time	Monthly Percent Uptime	Average Flow Rates FQI-401	FQI-201	FQI-501	FQI-402	Cumulative Groundwater Volume Treated	TCE Mass Removed Average TCE Concentration (SP-201)[1]	Average TCE Concentration (SP-210)[2]	Monthly Mass	Cumulative Mass	Removal Rate	VOC Mass Removed Average Total VOC Concentration (SP-201)[1]	Average Total VOC Concentration (SP-210)[2]	Monthly Mass	Cumulative Mass	Removal Rate
	Units:	(hours)	(hours)	(gpm)	(gpm)	(gpm)	(gpm)	(gallons)	(µg/L)	(µg/L)	(pounds)	(pounds)	(lbs/day)	(µg/L)	(µg/L)	(pounds)	(pounds)	(lbs/day)
April	a	144	100	16.6	0.0	0.3	20.4	205,838	NA	NA	0.84	0.84	0.08	NA	NA	0.93	0.93	0.09
May		732	98	17.6	2.8	1.2	29.9	1,400,260	610.0	110.0	4.57	5.42	0.11	618.5	110.0	5.14	6.07	0.13
June	b	511.5	71	15.2	1.0	2.6	23.2	2,474,225	435.0	108.8	3.11	8.53	0.07	435.0	114.3	4.02	10.09	0.09
July		741	100	24.6	0.7	2.7	33.3	3,934,100	360.0	29.5	2.64	11.17	0.08	360.0	65.5	4.34	14.43	0.12
August		738	99	23.6	0.3	3.4	33.5	5,484,900	562.5	29.3	4.63	15.80	0.11	566.0	129.0	5.35	19.78	0.12
September	c	652	91	25.0	1.1	3.4	33.3	6,934,790	407.5	15.6	3.49	19.29	0.10	460.8	141.7	11.71	31.49	0.34
October		741	100	22.2	0.9	1.9	30.5	8,388,205	135.0	9.1	1.57	20.86	0.03	172.5	329.0	6.16	37.65	0.13
November		693.8	96	25.4	1.1	1.1	35.9	9,831,202	286.0	6.9	2.04	22.91	0.06	300.0	231.0	3.42	41.07	0.11
December		713.5	96	24.0	1.1	2.3	36.5	11,460,978	385.0	11.2	3.24	26.15	0.10	468.5	108.0	6.04	47.11	0.16

Total Mass of TCE Removed during 2007 (pounds)	**26.2**
Total Mass of VOCs Removed during 2007 (pounds)	**47.1**
Average TCE Removal Rate during 2007 (lbs/day)	**0.08**
Average VOC Removal Rate during 2007 (lbs/day)	**0.14**
Average Groundwater Flow Rate during 2007 (gpm)	**31**
Cumulative Volume of Water Treated during 2007 (gallons)	**11,460,978**
Water Treament Plant Operating Time during 2007 (hours)	**5,667**
Water Treament Plant Percent Uptime during 2007 (%)	**94**

Notes:
1 - Sample collected from combined flow from all extraction wells into the treatment system.
2 - Sample collected from liquid stream leaving the moisture separator.
a - The groundwater treatment system began operation on 4/25/07.
b - The groundwater system was offline from 6/22/07 to 6/29/07 due to maintenance and GAC vessel repair.
c - The groundwater system was offline from 9/7/07 to 9/10/07 due to air compressor maintenance.
FQI-201 measures flow from non-contact water from the vapor conditioning unit; FQI-501 measures flow from the moisture separator; FQI-401 measures flow from all groundwater manifolds; and FQI-402 measures flow into the final holding tank prior to discharge.
Analysis for VOCs was performed by Calscience Environmental Laboratories, Inc. using EPA 8260B.
GAC - granular activated carbon
TCE - trichloroethene
VOC - volatile organic compound
NA - not applicable
µg/L - microgram per liter
gpm - gallons per minute
lbs/d - pounds per day

Table 4.6
Sewer Discharge Analytical Results for Effluent Groundwater Samples from SP-209
Pemaco Superfund Site, Maywood, CA

		Station ID:	SP-209	SP-209	SP-209
		Date:	4/25/2007	8/23/2007	11/20/2007
		Units:	µg/L	µg/L	µg/L
Analyte	**Method**	**Limit[1]**			
Volatile Organic Compounds					
Bromodichloromethane	EPA 8260B	--	1 U	**16**	1 U
Bromoform	EPA 8260B	--	1 U	**40**	1 U
Chloroform	EPA 8260B	--	1 U	**9**	1 U
Dibromochloromethane	EPA 8260B	--	1 U	**34**	1 U
Total VOCs[2]	EPA 8260B	**1,000 µg/L**	1 U	**90**	1 U
Semivolatile Organic Compounds					
Bis(2-Ethylhexyl) phthalate	EPA 8270C	--	10 U	10 U	**21**
Total SVOCs[2]	EPA 8270C	**1,000 µg/L**	10 U	10 U	**21**
General Chemistry Parameters					
		Units:	mg/L	mg/L	mg/L
Dissolved Sulfide	SM 4500 S2-D	**0.1 mg/L**	0.05 U	0.05 U	0.05 U
Oil and Grease	SM 5520 B	**--**	**1.4**	**2.4**	1 U
Chemical Oxygen Demand	EPA 410.4	**--**	**5**	**26**	**23**
Lead	EPA 6010B	**40 mg/L**	0.01 U	0.01 U	0.01 U
Total Suspended Solids	SM 2540 D	**--**	**4.9**	**3.1**	**--**
pH	SM 4500 H+B	**6.5 - 8.5**	**7.03**	**7.11**	**7.71**
Physical Data					
Total Wastewater Flow Rate	NA	**57,600 gpd**	26,784	28,510*	46,335
Peak Wastewater Flow Rate	NA	**40 gpm**	18.6	19.8*	32.2
Temperature	NA	**< 140°F**	--	96	84
Closed Cup Flash Point	NA	**> 140°F**	--	--	--

Notes:
1 - Limits are based on the water discharge permit issued by the Sanitation District of Los Angeles County.
See Appendix 5 for groundwater discharge permit details.
2 - Total VOCs were calculated using only individual VOC concentrations that were greater than 10 µg/L.
* - Estimated based on the Operation Summary Report (Appendix 7).
Analyses were performed by Calscience Environmental Laboratories, Inc. in Garden Grove, CA.
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete lab reports, see Appendix 4.
Bolded results indicate positive detections.
SVOCs - semivolatile organic compounds
VOCs - volatile organic compounds
NA - not applicable
U - not detected above the stated reporting limit
"--" - not available
µg/L - microgram per liter
^{o}F- degree Fahrenheit
gpd - gallons per day
gpm - gallons per minute
lbs/d - pounds per day
mg/L - milligram per liter

Table 4.7
DRE of the Gourndwater Treatment System
Pemaco Superfund Site, Maywood, CA

		Station ID:	**SP-201[3]**	**SP-210[4]**	**Total**	**SP-209**	**DRE (%)**	**SP-201[3]**	**SP-210[4]**	**Total**	**SP-209**	**DRE (%)**	**SP-201[3]**	**SP-210[4]**	**Total**	**SP-209**	**DRE (%)**
		Description:	Influent	Moisture Separator	Pre-GAC	Post-GAC		Influent	Moisture Separator	Pre-GAC	Post-GAC		Influent	Moisture Separator	Pre-GAC	Post-GAC	
		Date[1]:	4/25/2007					8/23/2007					11/20/2007				
Analyte	**Limit[2]**	**Units**															
Volatile Organic Compounds																	
1,1-Dichloroethane	--	µg/L	**2**	1 U	**2**	1 U	100.0	5 U	1 U	5 U	1 U	NA	2 U	1 U	2 U	1 U	NA
1,1-Dichloroethene	--	µg/L	**1.5**	1 U	**1.5**	1 U	100.0	5 U	1 U	5 U	1 U	NA	2 U	1 U	2 U	1 U	NA
1,4-Dioxane*	--	µg/L	**5.5**	50 U	**5.5**	2 U	100.0	**2.9**	**72**	**74.9**	**28**	62.6	**9.6**	50 U	**9.6**	**28**	NC
Benzene	--	µg/L	**1.4**	**0.59**	**1.99**	0.5 U	100.0	2.5 U	**1**	**1**	0.5 U	100.0	1 U	0.5 U	1 U	0.5 U	NA
Bromodichloromethane	--	µg/L	1 U	1 U	1 U	1 U	NA	5 U	**4.1**	**4.1**	**16**	NC	2 U	1 U	2 U	1 U	NA
Bromoform	--	µg/L	1 U	1 U	1 U	1 U	NA	5 U	**5.6**	**5.6**	**40**	NC	2 U	1 U	2 U	1 U	NA
Chloroform	--	µg/L	**9.3**	1 U	**9.3**	1 U	100.0	**7.6**	**11**	**18.6**	**9**	51.6	**6.8**	1 U	**6.8**	1 U	100.0
Dibromochloromethane	--	µg/L	1 U	1 U	1 U	1 U	NA	5 U	**5.6**	**5.6**	**34**	NC	2 U	1 U	2 U	1 U	NA
Tetrachloroethene	--	µg/L	**1.2**	1 U	**1.2**	1 U	100.0	5 U	1 U	5 U	1 U	NA	2 U	1 U	2 U	1 U	NA
Toluene	--	µg/L	1 U	1 U	1 U	1 U	NA	5 U	**59**	**59**	1 U	100.0	2 U	1 U	2 U	1 U	NA
trans-1,2-Dichloroethene	--	µg/L	**2.1**	1 U	**2.1**	1 U	100.0	5 U	1 U	5 U	1 U	NA	2 U	1 U	2 U	1 U	NA
Trichloroethene	--	µg/L	**670**	**110**	**780**	1 U	100.0	**730**	**7.4**	**737.4**	1 U	100.0	**290**	**7.8**	**297.8**	1 U	100.0
Vinyl chloride	--	µg/L	**0.88**	0.5 U	**0.88**	0.5 U	100.0	**3.1**	0.5 U	**3.1**	0.5 U	100.0	**2.2**	0.5 U	**2.2**	0.5 U	100.0
Total VOCs	**1,000**	**µg/L**	**694**	**111**	**804**	1 U	100.0	**744**	**166**	**909**	**118**	87.0	**309**	**8**	**316**	**28**	91.2

Notes:

1 - Samples from SP-201 were collected on 5/3/07, 8/21/07, and 11/19/07.
Samples from SP-210 were collected on 5/18/07, 8/21/07, and 11/19/07.
Samples from SP-209 were collected on the date shown.
2 - Limits are based on the water discharge permit issued by the Sanitation District of Los Angeles County. See Appendix 5 for groundwater discharge permit details.
3 - Sample collected from combined flow from all extraction wells into the treatment system.
4 - Sample collected from liquid stream leaving the moisture separator.
* - Samples collected from SP-209 were not analyzed for 1,4-dioxane; concentrations shown are from the post-secondary GAC samples from SP-208 (on 5/3/2007 and 8/21/07) and from SP-206 (on 11/19/07)
Analyses were performed by Calscience Environmental Laboratories, Inc. in Garden Grove, CA using method EPA 8260B.
Only anaytes with at least one positive detection in 2007 are listed in this table. For complete lab reports, see Appendix 4.
Bolded results indicate positive detections.
DRE - destruction and removal efficiency
GAC - granular activated carbon
NA - not applicable
NC - not calculated
VOCs - volatile organic compounds
U - not detected above the stated reporting limit
"--" - not available
µg/L - microgram per liter

Table 6.1
Optimization & Maintenance of the Treatment System Summary
Pemaco Superfund Site, Maywood, CA

Item No.	Description	Details
1	Solar Panel Construction	A 20 kWh/day solar system was installed to meet EPA sustainability goals.
2	Structural Modification to Roof for Scrubber	Performed custom sheet metal fabrication to house the scrubber loop.
3	DPE-Sumps & VE-Sumps Retrofit	1. Pressure tested existing system and repaired leaks 2. Replaced DPE-A level gauge 3. Retrofitted VE-3 & 4 valving to be compatible with ERH system 4. Installed four (4) pneumatic pumps with level controls in 4 DPE-sumps, to automate water removal
4	Moisture Separator T-101 Replacement	The first T-101 failed because it did not meet the required 29 in Hg vacuum specification. The tank replacement was performed by ERM under warranty. The second tank T-101 had to be reinforced by a steel "belt" around the tank after showing signs of structural stress.
5	Earthwork	1. Spread gravel outside the Treatment Compound to create a maintenance free compound yard 2. Installed a vault for the water meter to protect from the Treatment Compound traffic 3. Repaired PD-4 well vault to eliminate irrigation water infiltration
6	Dekker Pump Oil Blow by Remedy	1. Installed six (6) additional scavenge lines to capture excess oil 2. Replaced leaking Dekker filter 3. Installed additional Solberg demisting inserts in the oil filters F-103 and 104 4. Added vacuum gauges (0-30 in w.c.) to Solberg F-103 and F-104 to more accurately gauge headloss
7	Potable Water Pressure Boost System for FTO	Installed a water pressure boost system to maintain the water supply pressure per FTO operation requirements.
8	FTO Evaluation - Flow Meter, Fuel Sensitivity	Added manual magnehelic gauge. Inspected and optimized the gas control valve settings, burner temperature, checked influent vapor pressure alarms.
9	FTO-VCP Interface	TN&A installed the following items to allow the FTO to operate in tandem with the vapor conditioning package: 1. PS-101 pressure switch, wiring, and PLC interlock reprogramming 2. Barometric damper 3. Differential pressure gauge 4. Moisture drain valve for VE-201 5. PLC interlocks and reprogramming
10	FTO Valve Switch FCV-400 and XV-401	Retrofitted location of valve to match Anguil construction drawings.
11	FTO Bellows Insulation Remedy	1. Adjusted quench chamber spray nozzles and replaced the broken quench chamber insulation inside the FTO bellows in August 2007 2. Discovered another hot spot on the flexible duct on 12/18/07. The hot spot was caused by misalignment of #1B nozzle. Patched ceramic fiber blanket as a temporary repair of hot spot.
12	Raise T-402 LSHH Elevation	Increased virtual tank capacity, provided additional buffer against HH alarms in T-402.
13	7 QED Pumps Removal/Repaired	Sediment build up in downhole pumps caused pump shut down. Seven pumps were pulled, valves replaced, and the pumps were reinstalled several feet higher in the wells.
14	Electrical Related Retrofit and Repair	The following items were installed or retrofitted: 1. Two (2) underground junction boxes, conduit and wire for (2) telephone circuits and control wiring between MCP and the ERH area 2. One hand-off-auto switch at sump pump (P-502) 3. Two 100 watt 90 minute battery back-up emergency light fixtures in Treatment Compound 4. One 90 minute battery back-up battery for (1) control room light fixture 5. Conduit and wire from VCP to one (1) pressure switch at FTO 6. Two (2) broken conduits at FTO were replaced with steel conduits 7. Conduit and type J thermocouple wire from existing thermal couple at H-202 to MCP
15	Re-route Air-line to Double Diaphragm Pumps	Required to keep DD pumps operating after GW system shuts down, such as during GW tank High-High alarm.
16	Silencers for Dilution Valves	Added silencers for the dilution valves V-112 and V-319 to reduce noise while operating.
17	Moisture Traps for Magnahelic Gauges	Installed moisture traps to prevent unintended exhaust blower (B-301) ramp up.
18	Line Reactor for Potable Boost Pump	Installed manufacturer's recommended fix to control SCE voltage spikes
19	Resistor Package for P-402	Installed manufacturer's recommended fix to control SCE voltage spikes
20	GAC Vessel T-403 and T-404 Repair	Repaired broken fittings that attached the screen/filter inside of the carbon vessels. The replacement was required because the original fittings did not meet the manufacturer's specs.
21	Anti-Siphon for PVC line linking T-401 and T-402	Installed a PVC vacuum breaker/air relief valve for PVC line linking T-401 and T-402.
22	T-401 Chlorine Injection System	Installed a chlorine injection system to control algae build up in the holding tanks and reduce the filter bag consumption.
23	Security System for ERH Area	Installed a double-beam system with interlocks and alarm for safety concerns. The system automatically shuts down the ERH system and power supply if an intrusion occurs.
24	ERH Fence Extension along the Bike Path	Installed additional fence extension along the bike path to discourage unauthorized entry to the ERH area.
25	Custom Sample Ports for Dioxin Testing	Installed two custom 8 in diameter fiberglass spools with opposing 3 in diameter flanged sample ports for dioxin sampling.
26	GAC Backwash System	Performed conceptual design of GAC backwash system to resolve numerous high level shut downs of the treatment plant caused by excessive sediment in the pumped groundwater.
27	MW Well Cap retrofit in ERH Area	Retrofitted 20 monitoring wellheads to be compatible with ERH heat and pressure generation.
28	Upgrade MW-24-110 to Extraction Well	Installed pump and plumbing from MW-24-110, aboveground, to vault at MW-24-140. Installed air regulator and controller.
29	FE-101 Reporting Incorrect Air Flow	Relocated dPIT-101 to measure more accurate air flow.
30	LRP Oversize Sheaves Replacement	Replaced Dekker Liquid Ring Pump B-101/B-102 oversize sheaves (10 7/8") with new sheaves (9 ¾"). The oversize sheaves caused the two blower motors to run at a higher than specified ampacity. The high ampacity caused excess heat in the LRP electrical panel, necessitating the replacement of the motor overload protection models, some wiring, and the addition of a panel fan. In hindsight, Dekker did not catch the oversize sheave during QA/QC at the assembly shop.
31	FTO Broken Part Replacements	1. SV-844 Solenoid Valve (twice). 2. 3/4" Leaking CPVC Fittings (FTO Blowdown Line next to SV-844). 3. FSL-872 3/4" NPT Flow Switch (twice). 4. LE-832 Level Transmitter. 5. Starter for the FTO recirculation pump.
32	Well RW-01-70 Retrofit	Well RW-01-70 is an A-Zone well in ERH area that went dry retrofitted as a SVE well.

Notes
:

CPVC - chlorinated polyvinyl chloride
DD - double diaphragm
DPE - dual-phase extraction
ERH - electrical resistance heating
FTO - flameless thermal oxidizer
GAC - granular activated carbon
GW - groundwater;
kWh/day - kiloWatt hours per day
LRP - liquid ring vacuum pump;
MCP - main control panel
PLC - programmable logic controller
PVC - polyvinyl chloride
SCE - Southern California Edison Inc.
SV - solenoid valve
VCP - vapor conditioning package;
VE - vapor extraction

Table 6.2
Daily and Weekly Maintenance Summary
Pemaco Superfund Site, Maywood, CA

No.	Operation and Maintenance Task	Frequency	Crew
1	Change filter bags for F-401/F-402, F-403/F-404, and F-501/F-502 as required. Check before leaving every day.	Daily	M. Tabora
2	Record differential pressure of T-403 and T-404 (carbon vessels for GW). Scrape carbon as needed.	Daily	M. Tabora
3	Inspect water softner F-801, add salt to the brine tank as needed.	Daily	M. Tabora
4	Inspect secondary containment sump. Pump down the sump as needed.	Daily	M. Tabora
5	Inspect of DPE and VE condensate sumps. Pump down the sumps and remove scale as needed.	Daily	M. Tabora
6	Inspect the water level in cooling tower CT-201 and check recirculating pump pressure differential.	Daily	M. Tabora
7	Add chlorine to T-101 using granular chlorine (6 oz per day) or liquid chlorine (8 oz).	Daily	M. Tabora
8	Inventory management of PPE, chlorine liquid, granules, tablets, oil & lubricants, filter bags, and spare parts.	Daily	M. Tabora
9	Check chlorine injection system, look for air pockets in line. Repair as needed.	Daily	M. Tabora
10	Take chlorine residual readings after T-402. The chlorine should maintain 1.5 to 2.0 ppm. Adjust chlorine injection pump speed and stroke as needed.	Daily	E. Moncayo
11	Inspect operation of FTO and check for hot spots and other problems with ceramic burner elements.	Daily	E. Moncayo
12	Conduct daily tailgate safety meetings, practice hazard communication and complete Daily QC report.	Daily	M. Prostko
13	Inspect ERH Security System	Daily	M. Prostko
14	All Sampling and Forms (#1 ~ #13)	Weekly	M. Prostko
15	Perform FTO Weekly Maintenance Checks	Weekly	E. Moncayo
16	Record differential pressure of oil mist filters F-103/F-104. Change filter element as needed. Inspect of oil scavenge lines for leaks and proper functioning.	Weekly	M. Tabora
17	Inspect GW-3 secondary containment overflow, pump water if necessary.	Weekly	M. Tabora
18	Complete - Exposition Wells, Perched Wells, ERH VR Wells /Electrode Well forms	Weekly	E. Moncayo
19	Record differential pressure of T-301 and T-302 (carbon vessels for Vapor). Scrap carbon as needed.	Weekly	M. Tabora
20	Grease motors in TC.	Weekly	E. Moncayo
21	Complete Weekly QC Report, Labor Schedule, and Weekly BMP Inspection.	Weekly	M. Prostko
22	Track all gov owned small tools that should be on the site .	Weekly	M. Prostko

Notes:
BMP - best management practices; DPE - dual-phase extraction; ERH - electrical resistance heating; FTO - flameless thermal oxidizer
GW - groundwater; QC - quality control; TC - treatment compound; VE - vapor extraction; VR - vapor recovery
ppm - part per million by volume

Table 6.3
Equipment Maintenance Schedule
Pemaco Superfund Site, Maywood, CA

Equipment ID	Description	Manufacturer/Model	Maintenance Parts	Maintenance Type	Frequency Required	Date Performed in 2007		Comments
B-101 B-102	Liquid Ring Vacuum Pump	Dekker VMX1103K	Pump Bearings	High Temperature Lithium Based Grease of #2 Consistency	Every 3,000 hours	10/8/07	1/15/2008 B-101 oil changed	
			Sealing Fluid	Vmaxol Sealing Fluid	Every 10,000 hours			
B-301	Positive Displacement Blower	Roots Rotary Blower Size 615		ROOTS Synthetic Oil	Every 4,000 to 8,000 hours	8/17/07		Oil changed 8/17/07
P-201	Cooling Tower Transfer Pump	SCOT ARDOX Motorpump - 1750 RPM		Inspection	Every 3 months	10/8/07	12/20/07	Does not require lubrication
P-202	Refrigerated Chiller Pump	ITT Goulds Pump - 2ST1H5B4	Bearing Frame	#2 Sodium or Lithium Based Grease	Every 2,000 hours	10/8/07	12/20/07	
P-203	VC Package Condensate Pump	Pacer Pump - Z-40		Inspection	Every 3 months	10/8/07	12/20/07	Does not require lubrication
P-401	Booster Tank Pump	ITT Goulds Pump - 2ST1H2B4	Bearing Frame	#2 Sodium or Lithium Based Grease	Every 2,000 hours	10/8/07	12/20/07	
P-402	Holding Tank Pump	ITT Goulds Pump - 2ST1JSA4	Bearing Frame	#2 Sodium or Lithium Based Grease	Every 2,000 hours	10/8/07	12/20/07	
P-501	Moisture Seperator Transfer Pump	AMT 282B-98		Inspection	Every 3 months	10/8/07		Does not require lubrication
P-502	Secondary Sump Pump	Gorman-Rupp Pump S2H54 E1	Seal Cavity	Inspection	Every 3 months	10/8/07		Does not require lubrication
P-901	Metering Pump	MiltonRoy D7988PE1NIN		Inspection	Every 3 months	10/8/07		Does not require lubrication
K-601	Air Compressor	Kaeser AS-30		Service	Every 2 months	9/7/2007 (American Compressor)	12/3/2007 (American Compressor)	Changed oil and air filter was replaced 9/7/07.
F-801	Water Softner	U.S. Filter KF Series KFZSDO21FPZVCX	Manual Valves	Inspection	Inspect Every 6 months			
CT-201	Cooling Tower	Aqua-Loop MB-300	V-Belt	Inspection	Every 5,000 to 10,000 hours			
H-201	Heat Exchanger	Xchanger TV-275		Inspection	Every 3 months	10/8/07		Does not require lubrication
H-401	Heat Exchanger	Xchanger LC-24-2		Lubrication	Refer to the maintenance instructions provided with the motors	10/8/07		
RC-201	Refrigerated Chiller	Zarsky ACWC-300-E	Condenser Coils	Inspection/Clean	Every 6 months			
NA	Water Pressure Boost Pump	Goulds 3SVB-4ST6		Lubrication	Every 6 months	10/8/07		

Notes:
NA - not applicable

Table 6.4
FTO Maintenance Schedule
Pemaco Superfund Site, Maywood, CA

Description	Action Required	Frequency	Date Performed in 2007	
General				
Weekly Maintenance Checks	Follow Anguil weekly inspection instruction.	Weekly	NA	
System Fan/Blower				
Fan and Motor Bearing Lubrication	Follow blower and motor manufacturer's instructions	Every 2,000 Hours	10/8/07	
Fan Wheel	Check and clean quarterly. If worn out or out of balance (excessive vibration) contact Anguil.	Quarterly	10/8/07	
Air Proving Switch	Check for proper operation by increasing set point until the switch trips.	Semi-annually		
Inlet Filter	Check every 30 days of operation. Clean or replace, if required.	30 Days	10/8/07	
Belt/Power Band	Inspect for proper belt tension monthly or 2-3 days after any belt replacement, as applicable to your specific unit. Tighten or replace as necessary, following manufacturer's instructions.	30 Days	10/8/07	
Controllers				
Configuration/Calibration	Check and adjust quarterly. Check for proper air flow measurement/recording. Calibrate transmitter, as necessary.	Quarterly		
Controllers	Check for proper air flow measurement/recording. Calibrate transmitter, as necessary.	Quarterly		
Burner				
UV Scanner/Spark Ignitor	Inspect UV scanner and spark ignitor quarterly. Clean if necessary, replace yearly.	Quarterly		
Burner	Have burner tuning checked yearly by Anguil or qualified Alzeta Burner Technician. Technician should also check operation of burner assembly parts, such as the check valve, pilot assembly and fuel train.	Yearly		
Fuel Train				
Shut Off Valve	Check main shut off valve for leakage semi-annually.	Semi-annually		
Pressure Switch	Check high and low gas pressure switches. Verify proper operation by adjusting set point up or dwon until the switch open.	Semi-annually		
Gas Pressure	Verify that all gas pressures are within previously recorded parameters.	Semi-annually		
Firing Rate Valve	Check operation of firing rate valve and actuator. Use controller manual mode to run it through its full stroke. Check linkage for blinding, slippage, wear and corrosion. Replace if necessary.	Semi-annually		
Dampers				
	Check system inlet, dilution air and bypass dampers for free movement. Check linkage for blinding, slippage, wear and corrosion. Replace if necessary.	Semi-annually	10/8/07	
General				
Nuts and Bolts	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Mounting Plate of Burner	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Ductwork to Burner	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Top and Bottom Reactor Doors	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Hot Air Bypass Inner and Outer Doors	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Stack and Stack Transition	Quarterly inspect locations for tightness, as applicable to your specific unit. Tighten, as necessary.	Quarterly	10/8/07	
Safety Review				
Safety Review Meeting	A yearly safety review of the equipment should consist of a meeting with all operation and maintenance personnel to review hazards.	Yearly		
Anguil Service Annual Visit	Annual visit by trained Anguil Service Technician for check of system balance and control calibration	Yearly		

Notes:
FTO - flameless thermal oxidizer
NA - not applicable

Table 8.1
Resource and Utility Usage Summary
Pemaco Superfund Site, Maywood, CA

	Water Usage (thousand gallons)	Gas Usage (cubic feet)	Treatment Plant Electric Usage (kWh)	ERH Electric Usage (kWh)	Number of Filter Bags Used [1]	Number of 55-pound Bags of Salt[2]	Caustic Solution[3] (gallon)
January	6	--	--	--	--	--	--
February	5	--	1,120	--	--	--	--
March	5	--	240	--	--	--	--
April	49	--	5,440	--	14	--	800
May	356	3,784	43,520	--	105	34	--
June	435	5,773	105,840	--	152	27	--
July	532	7,477	65,280	--	219	39	--
August	556	8,475	135,833	--	119	72	1,055
September	853	11,027	107,608	--	56	69	--
October	583	11,996	159,660	655,506	77	83	--
November	1,082	10,550	129,817	869,931	131	68	1,055
December	760	11,383	139,406	794,433	221	75	1,055
TOTAL:	**5,222**	**70,465**	**893,764**	**2,319,870**	**1,094**	**467**	**3,965**

Notes:

1 - Filter bags were used for F-401, F-402, F-403, F-404, F-501, and F-502 bag filters.

2 - Salt was used for F-801 water softener in the treatment plant.

3 - Caustic solution (25% NaOH with 10% sodium thiosulfate) was used for FTO scrubber operation.

ERH - electrical resistance heating

FTO - flameless thermal oxidizer

kWh - kiloWatt hour

Table 10.1
Waste GAC and Filter Bag Disposal Summary
Pemaco Superfund Site, Maywood, CA

Date	Liquid/Vapor	Vessel ID	Volume/Quantity	Subcontractor	TSDFs (treatment, storage, and disposal facilities)	Manifest Number
GAC Disposal						
6/20/2007	Liquid Phase	T-403	3,000 pounds	Prominent Systems	Chemical Waste Management, Inc., Kettleman City, CA	NH08280702
7/17/2007	Liquid Phase	T-404	3,000 pounds	Prominent Systems	Chemical Waste Management, Inc., Kettleman City, CA	NH08280702
11/2/2007	Liquid Phase	T-403	3,000 pounds	Prominent Systems	Chemical Waste Management, Inc., Kettleman City, CA	NH12170701
11/27/2007	Liquid Phase	T-404	3,000 pounds	Prominent Systems	Chemical Waste Management, Inc., Kettleman City, CA	NH12170701
Filter Bag Disposal						
7/13/2007	NA	NA	285	Haz Mat Trans	Siemens Water Technologies Corp., Vernon, CA	NH54754-A
8/10/2007	NA	NA	255	Haz Mat Trans	Siemens Water Technologies Corp., Vernon, CA	NH54974-A
11/8/2007	NA	NA	222	Haz Mat Trans	Siemens Water Technologies Corp., Vernon, CA	NH55802-A

Notes:

Anaytical reports for filter bag and carbon profiles issued by Calscience Environmental Laboratories are included in Appendix 6.

GAC - granular activated carbon

TSDF - Treatment Storage and/or Disposal Facility

Table 11.1
Sample Daily Report
Pemaco Superfund Site, Maywood, CA

RAPID RESPONSE QUALITY CONTROL DAILY REPORT

Contractor's Name: T N & Associates

Contract Number: **DACA45-00-D-0006**

Site Name & Location: Pemaco; Maywood, CA

INSTRUCTIONS

The contractor shall submit this form daily at the close of business to the on-site COE representative. Concurrently, the contractor shall provide electronic access to the completed forms to the COE district office and the area office.

Report #: 20071203	Delivery Order #:06	Date: 12-03-2007
Weather: Sunny	Temp. (max & min): 53-72	Rainfall (in): 1.03

1. Work performed today by primary contractor on site and/or off site:
   1) Mark Prostko, Dave Allen, Edwin Moncayo, Miguel Tabora and John Wingate onsite at various times from 0630 to ~1700 to perform O&M and process sampling. Mark Wanek and Ali Kaseeh (TN&A) on site for quarterly GW sampling with Blaine Technical Services (BTS).
   2) Refer to Operations Summary Table rev 12/03/07 for filter bag changes, chlorine dosing, FQI-402 meter readings and significant operational changes. Note: Vapors are being extracted from the electrodes and all CVR/VR wells from the ERH area. Vapors being pulled from VE-3, DPE-A, DPE-B, and DPE-D. ERH area condenser VE-3 pitot tube measured today 1519 hours at 1.45” Hg; 17” Hg and 78 degrees F.
   3) FTO was shut down today for approximately 5 hours to inspect the electrical connections within the peckerheads of the motors and also at the starter/thermal overload areas. Jeffries Electric replaced the thermal overload for B-101 and replaced the relay for B-102 cooling fan motor. Also ID’d source of “mystery” E-stop alarm, linked to GFI Circuit #1 in LC-1 panel. Mike Ebner contacted for troubleshooting, further follow-up required to understand link between LC-1 and PLC panel.
   4) Dekker Vacuum Technologies shipped incorrect retrofit sheaves for the pumps B-101/B-102. Parts could only be ID’d as incorrect after plant shut-down and belt guards were removed, allowing access. JW is coordinating with Dekker and MK Environmental for correct sheaves and will plan installation for Wednesday. Follow-up correspondence to be provided by JW.
   5) American Compressor technician on site for scheduled 2,000 service on plant air compressor K-601. This also required plant shut down and was timed to blower maintenance.
   6) MP checked operations and went over the plant before leaving the site at ~1615 hours. Mark Wanek and Ali Kaseeh on site with BTs sampler. GW and FTO systems running well.

2. Work performed by subcontractors on site and/or off site (include a complete description):

Subcontractors:

EarthTech (Subcontractor)
09:00 AM to 5:00 PM
Edwin on site. Worked with JW inspecting new sheaves for B-101/B-102. Took apart QED pump for condensate sump DPE-B. Cleaned pump put back on line.

CLEVECO (Subcontractor)
08:00 AM to 5:00 PM
Miguel on site for continued O/M training. Working with Edwin and collecting daily readings. Change filter bags and helped MP load salt bags that were drop shipped to the site on Saturday by Eversoft.

Jeffries Electrical(Subcontractor)
11:30 AM TO 2:30 PM
Tony on site today to install new thermal overload and relay for B-101 within the LRP panel. Also worked with JW troubleshooting the E-stop alarm that occurred over the weekend and its relation to GFI circuit #1 in LC-1 Panel.

Blaine Technical Services, Inc. (Subcontractor)
07:00 AM to ~5:00 PM
One technician with sampling truck on site today to begin gauging all wells on site.

American Compressor (Subcontractor)
08:30 AM to 10:00 AM
Technician on site as scheduled by MP to complete routine 2,000 maintenance service on K-601.

TRS/ERG (Subcontractor)
Not on site today.

3. Complete and attach the daily personnel cost report at the end of this document and label as Appendix 1.
[PROVIDED IN SEPARATE BINDER]

4. On-site conditions which resulted in delayed progress:
None

5. Type and results of inspections (indicate whether: P-Preparatory, I-Initial, or F-Final and include satisfactory work completed or deficiencies with action to be taken):

Deficiencies (Ongoing list and newly identified)

Work Check List

1. REFER TO SEPARATE O&M CHECKLIST O&M to be provided one time per week (Thursday) to coincide with our RA Update Meetings.

Certification: I CERTIFY THAT THE ABOVE REPORT IS COMPLETE AND CORRECT AND THAT I, OR MY AUTHORIZED REPRESENTATIVE, HAVE INSPECTED ALL WORK PERFORMED THIS DAY BY THE PRIMARY CONTRACTOR AND EACH SUBCONTRACTOR AND HAVE DETERMINED THAT ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP ARE IN STRICT COMPLIANCE WITH THE PLANS AND SPECIFICATIONS, EXCEPT AS NOTED ABOVE.

____Mark Prostko_____________

Contractor's designated quality control representative

Table 11.2
Sample Operation Summary Report
Pemaco Superfund Site, Maywood, CA
Rev: 1/02/08

Date	Vapor System Runtime (hr)	GW System Runtime (hr)	FQI-402 Cumulative (gal)	Liquid Phase GAC Lead Vessel	Vapor Phase GAC Lead Vessel	F-801 Salt Refill (no. of 50lb bags)	Filter Bag Change-Out												Chlorination							O&M Comments
							F-401		F-402		F-403		F-404		F-501		F-502		T-101		T-401 Dose T-402 Conc.		CT-201		T-202	
							Micro	No.	Micro	No.	Micro	No.	Micro	No.	Micro	No.	Micro	No.	Dose	ppm	Dose	ppm	Dose	ppm	Algaecide	
12/1/07	22.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	2	5/1	2	5/1	2	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 50% speed 45% stroke	1.5	N/A	N/A	N/A	Miguel monitoring plant operations. T-202 High High level took down FTO. FTO restarted within 2 hours.
12/2/07	19.0	19.0	N/A	T-403	T-301	5	25/10	6	25/10	1	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 50% speed 45% stroke	1.5	N/A	N/A	N/A	Miguel monitoring plant operations. E-Stop alarm and possible power outage at ~955 AM. FTO and GW down for 5 hours. Plant restarted at 200 PM.
12/3/07	19.0	24.0	10,012,295	T-403	T-301	3	25/10	2	25/10	1	5/1	1	5/1	1	25/10	1	25/10	0	6 oz. granular chlorine	N/A	Injection 50% speed 45% stroke	1.5 - 2.0	N/A	N/A	N/A	FQI reading at 1430 hours. Shut down FTO for 5 hours to work on electrical at LRP panel (B-101/B-102) and attempt sheave install. Installed new thermal overload for B-101. WW Henry plant is running today. Compressor 2000 Hour Service performed.
12/4/07	24.0	24.0	10,057,231	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	1	6 oz. granular chlorine	N/A	Injection 50% speed 45% stroke	1 - 2.5	N/A	N/A	N/A	FQI reading at 0900 hours. Added 12 ounces granular chlorine to T-401 in AM to boost chlorine residuals. WW Henry plant is running today.
12/5/07	20.5	23.0	10,116,772	T-403	T-301	6	25/10	0	25/10	0	5/1	1	5/1	1	25/10	1	25/10	0	6 oz. granular chlorine	N/A	Injection 50% speed 45% stroke	3.0	N/A	N/A	N/A	FQI reading at 0900 hours. PT-201 backed up in AM trying to pump to drain. FTO down for 1.5 hours. Water from T-201 being directed to T-402 now. Pressure washed ~ 50' of sewer line from sample box exit point. FQI-402 had a broken disc inside, clogging flow to the sample box. SSV sampling today. WW Henry plant is running today.
12/6/07	24.0	24.0	10,169,505	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	1	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	1.0 -2.0	N/A	N/A	N/A	FQI-402 reading at 0930 hours. 1500 hours changed sheaves on motors for B-101/B-102 (using smaller diameter sheaves). B-101/B-102 operating at ~ 90 A. PID readings in ERH area zones 802, 803 and 805. WW Henry plant is running today.
12/7/07	24.0	24.0	10,228,900	T-403	T-301	5	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	1	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 reading at 0930 hours. Completed tedlar/PID readings in ERH area at zones 801 and 804. Pressure washed cooling tower protective outer mesh. WW Henry plant is running today.
12/8/07	24.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	2	5/1	2	5/1	2	25/10	0	25/10	0	6 oz granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	Miguel monitoring plant operations. All systems running well. High pressure at T-404 (plant sewer from sample box to street manhole line needs total cleaning out). Will be done on Monday with pressure washer. WW Henry plant is running today.
12/9/07	8.5	8.5	N/A	T-403	T-301	7	25/10	0	25/10	0	5/1	1	5/1	1	25/10	0	25/10	0	N/A	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	Miguel monitoring plant. FQI-402 failed at 815 hours effectively choking off the discharge line from the plant to the sewer box. This shut down the FTO. Will replace FQI-402 with upgraded internal parts next week.
12/10/07	14.0	15.0	10,358,246	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	0	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 is broken no reading today. Plant was shut down Sunday due to mechanical problems with FQI-402. Removed broken parts from meter and restarted FTO andfGW systems. BEGI TROUBLESHOOTING FTO pH ISSUE - checked on calibrated of pH probe. Normal. Reset chiller RC-201. WW Henry plant is running today.
12/11/07	24.0	24.0	10,409,535	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	1	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 waiting for repair kit. Added 200 gallons 25% NAOH to T-901 today. WW Henry plant is running today.
12/12/07	24.0	24.0	10,474,247	T-403	T-301	5	25/10	8	25/10	2	5/1	1	5/1	1	25/10	2	25/10	1	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	Repaired FQI-402. FQI-402 reading at 1530 hours. SSV sampling today (SSV-04 to SSV-09). Almega sampling in TC today. Condensate sump pump DPE-B not working. Scraped the top of T-403 GAC bed/backflushed with potable water.WW Henry plant is running today.

Pemaco Superfund Site, Maywood, CA

Rev: 1/02/08

Date	Vapor System Runtime (hr)	GW System Runtime (hr)	FQI-402 Cumulative (gal)	Liquid Phase GAC Lead Vessel	Vapor Phase GAC Lead Vessel	F-801 Salt Refill (no. of 50lb bags)	Filter Bag Change-Out F-401 Micro	F-401 No.	F-402 Micro	F-402 No.	F-403 Micro	F-403 No.	F-404 Micro	F-404 No.	F-501 Micro	F-501 No.	F-502 Micro	F-502 No.	Chlorination T-101 Dose	T-101 ppm	T-401 Dose T-402 Conc. Dose	T-401 Dose T-402 Conc. ppm	CT-201 Dose	CT-201 ppm	T-202 Algaecide	O&M Comments
12/13/07	24.0	24.0	10,522,664	T-403	T-301	0	25/10	2	25/10	1	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 30% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 reading at 1230 hours. Changed setpoints LSL832A to 19" and LSH832A to 20". Calibrated conductivity probe with 5000 micro siemens buffer solution. WW Henry plant is running today.
12/14/07	20.0	24.0	10,573,913	T-403	T-301	5	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	1.0	N/A	N/A	N/A	FQI-402 broke at ~0630 hours shutting down FTO/GW systems. Restarted GW system immediately. FTO back on at ~1100 hours. Increased speed to 35%. Set freeze-stat on RC-201 to 50 degrees F. Scraped the top of T-403 GAC bed/backflushed with potable water. WW Henry plant is running today.
12/15/07	24.0	24.0	N/A	T-403	T-301	0	25/10	0	25/10	0	5/1	0	5/1	0	25/10	0	25/10	0	N/A	N/A	Injection 35% speed 30% stroke	1.0	N/A	N/A	N/A	Miguel supervised the plant Saturday/changed filter bags.
12/16/07	24.0	24.0	N/A	T-403	T-301	0	25/10	0	25/10	0	5/1	0	5/1	0	25/10	0	25/10	0	N/A	N/A	Injection 35% speed 30% stroke	1.0	N/A	N/A	N/A	Danny Chen supervised the plant/changed filter bags.
12/17/07	24.0	24.0	10,705,839	T-403	T-301	8	25/10	4	25/10	2	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 under maintenance. WW Henry plant is running today. Performed pH testing and caustic pump testing. Determined FTO pH screen reading is 1 pH unit less than manual readings. Caustic pump triubleshooting performed.
12/18/07	22.5	24.0	10,749,613	T-403	T-301	0	25/10	2	25/10	0	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 under maintenance. WW Henry plant is running today. Discovered a hot spot on the FTO bellows. Alzeta onsite and shut the FTO off for inspection. The bellow insulation was temporarily repaired (see Daily Report for details). FTO back online within 2 hours.
12/19/07	23.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 under maintenance. SSV sampling on Walker and 59th Place. Shut FTO down for 1 hour while scraping/removing GAC at T-403. Repaired DD pump. Opened DPE-B and DPE-D today. Pulling from DPE-A, DPE-B, DPE-D and VE-3.WW Henry plant is running today.
12/20/07	24.0	24.0	N/A	T-403	T-301	7	25/10	0	25/10	1	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	2.0	N/A	N/A	N/A	FQI-402 under maintenance. JW/EM makes adjustments to calibration of pH probe at FTO to read 8.4. Opened DPE-C today. Pulling from DPE-A, DPE-B, DPE-C, DPE-D and VE-3. WW Henry plant is running today.
12/21/07	24.0	24.0	10,910,166	T-403	T-301	3	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	1.0	N/A	N/A	N/A	FQI-402 under maintenance. Increased stroke to 35% from 30% for chlorine injection pump. Added 3 tablets chlorine to T-402. Scraped another 3" of GAC at T-403 due to bio-fouling layer. Added 55-gallons glycol to RC-201 water system. Same vacuum extraction headers online as yesterday. WW Henry plant is running today.
12/22/07	24.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	1.0-2.0	N/A	N/A	N/A	Edwin supervised the plant Saturday/changed filter bags. Same vacuum extraction headers online as yesterday.
12/23/07	17.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 30% stroke	1.0-2.0	N/A	N/A	N/A	Edwin supervised the plant Sunday/changed filter bags. FTO was shut down for 7 hours for faulty flow switch at FTO quench line (switch was replaced last month). Pulling from DPE-A, DPE-B, DPE-D and VE-3 after repairs to FTO.
12/24/07	21.8	24.0	N/A	T-403	T-301	6	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	1.0-2.0	N/A	N/A	N/A	Miguel supervised the plant Monday/changed filter bags. FTO down for 2.25 hours as pump for T-201 seemed to lose prime. Pulling from DPE-A, DPE-B, DPE-D and VE-3
12/25/07	24.0	24.0	N/A	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2.0	N/A	N/A	N/A	Miguel supervised the plant Tuesday/changed filter bags. Pulling from DPE-A, DPE-B, DPE-D and VE-3
12/26/07	23.0	24.0	11,189,078	T-403	T-301	5	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2.0	N/A	N/A	N/A	JW/MP supervised plant and troubleshooting NAOH pump control/stroke issues affecting pH of system. Pulling from DPE-A, DPE-B, DPE-D and VE-3

Pemaco Superfund Site, Maywood, CA

Rev: 1/02/08

Date	Vapor System Runtime (hr)	GW System Runtime (hr)	FQI-402 Cumulative (gal)	Liquid Phase GAC Lead Vessel	Vapor Phase GAC Lead Vessel	F-801 Salt Refill (no. of 50lb bags)	Filter Bag Change-Out F-401 Micro	F-401 No.	F-402 Micro	F-402 No.	F-403 Micro	F-403 No.	F-404 Micro	F-404 No.	F-501 Micro	F-501 No.	F-502 Micro	F-502 No.	Chlorination T-101 Dose	T-101 ppm	T-401 Dose T-402 Conc. Dose	T-401 Dose T-402 Conc. ppm	CT-201 Dose	CT-201 ppm	T-202 Algaecide	O&M Comments
12/27/07	24.0	24.0	11,237,904	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2.0	N/A	N/A	N/A	MP/Edwin supervised plant. Crew scraped carbon from top of T-403 in PM. Changed low speed setting for P-402 to 70% (from 80%) to see effect on carbon pressurs. Weekly offsite SSV and system vapor sampling completed today. Added DPE-C to the vacuum extraction.
12/28/07	24.0	24.0	11,290,316	T-403	T-301	5	25/10	4	25/10	1	5/1	0	5/1	0	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2.0	N/A	N/A	N/A	MP/Edwin supervised plant. Salt delivery 35 bags. Completed VR tedlar/PID sampling in ERH area (Zone 805). Pulling from DPE-A, DPE-B, DPE-C, DPE-D and VE-3. T-403/T-404 GW carbon pressures less than 20 psi.
12/29/07	24.0	24.0	N/A	T-403	T-301	0	25/10	0	25/10	0	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2	N/A	N/A	N/A	Edwin covered plant operations today. Vacuum extraction being pulled from DPE-A, DPE-B, DPE-C, DPE-D and VE-3. Backwashed T-404 today.
12/30/07	24.0	24.0	N/A	T-403	T-301	5	25/10	4	25/10	1	5/1	0	5/1	0	25/10	0	25/10	0	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2	N/A	N/A	N/A	Miguel covered plant operations today. Vacuum extraction being pulled from DPE-A, DPE-B, DPE-C, DPE-D and VE-3. T-403/T-404 GW GAC pressures less than 20 psi.
12/31/07	17.0	24.0	11,460,978	T-403	T-301	0	25/10	4	25/10	1	5/1	1	5/1	1	25/10	1	25/10	1	6 oz. granular chlorine	N/A	Injection 35% speed 35% stroke	2.0	N/A	N/A	N/A	MP/Miguel supervised the plant today. VR tedlar PID bag sampling completed at zones 801, 802, 804 and 805. FTO shut down two times due to control circuit inside FTO short circuiting. Will troubleshoot the problem Wednesday 1/2/08.
Totals	679.3	713.5				75		100		29		29		29		17		17								
Uptime	91.30%	95.90%																								

Month Cumul Gallons	1,448,683
Daily Average (gallons)	46,732
Monthly Average GPM	32.45

Total Bags Used 221

Note:

1. N/A = Data Not Available.
2. Shaded rows are weekends.
3. X indicates algaecide added per manufacturer recommendations.
4. FQI-402 readings in red were collected from sum of FQI-401 and FQI-501 plus estimated water from FTO ~10 gpm.

Table 11.3
Sample Project Schedule
Pemaco Superfund Site, Maywood, CA

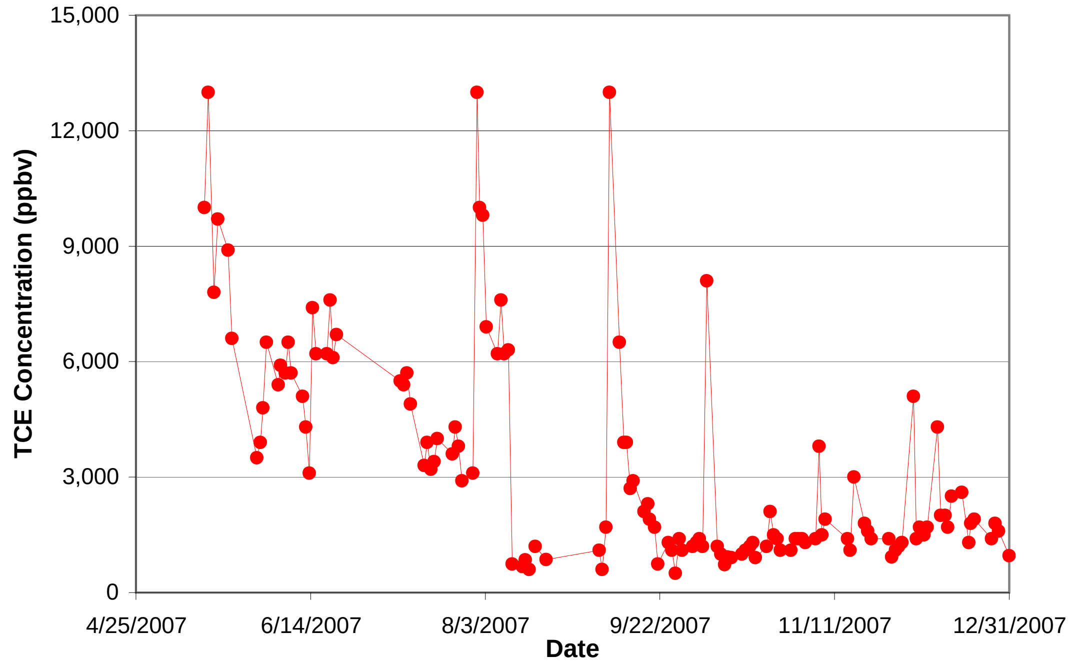
ACTIVITY & Detail	WEEK OF NOV 19 to NOV 25, 2007							WEEK OF NOV 26 to DEC 02, 2007							WEEK OF DEC 03 to DEC 09, 2007						
	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN
	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9
O&M Manual Review & Construction Completion Report Returned O&M Manual comments to ERM/J&H to finalize the final O&M Manual. Received a response on Tuesday 11/21, from ERM requesting additional information before they begin revisions. TN&A will provide info by Tuesday Nov. 27.									TN&A to provide ERM with additional comment info.												
Health and Safety Audit TN&A will conduct an in-house H&S audit beginning with AHA's, Site Documentation, and Sampling Safety SOPs.									H&S Audit TBD	H&S Audit TBD	H&S Audit TBD										
Misc. Construction Items Implement BMP weekly Inspection + Post-Rain Event Monitoring. Diaphragm pump repair successful. Will operate on second pump once retorfit kit is provccured. Will need 3000 psi pressure washer and reverse head spayer attachment inorder to clear scale from 4 perched zone wells. Pressure washer can also be used to clean T-401/402 and eliminated confinced space entry.	FTO Troubleshoot with Anguil	FTO Troubleshoot with Anguil						Procurement tasks for pressure washer and O&M parts		Retrofit second DD pump.											
Plant Optimization Tasks SCADA flow calibrated adn working well. TRS must clean their level controls for the condenser pump. Will return stainless steel strainer basket for FTO, need a different size than what was provided by Hayward. Level controls in secondary containment sump need to be continually checked because of inconsistent operation.	Clean T-402	SS Strainer Basket Delivery	Clean T-401		Dave Onsite	Mark Onsite	Edwin Onsite		GAC Changeout on T-404												
GAC Backwash Remedy Back On Optimization List to avoid confinced space entrys and reducnce H&S risks. May consider future GAC backwash system placement at location of FTO - once removed. Tetrasolve still required to replace Tank innards with SS screen to meet backwash pressures. Received sand filter quote from Tetrasolv on 11/14.																					
ERH Weekly Reports Sent out on Mondays. Sumarize in meetings.	8th Weekly ERH Progress Report							9th Weekly ERH Progress Report							10th Weekly ERH Progress Report						
ERH Monitoring & Optimization Optimizing GW extractions, vapor extracton, and ERH operations.																					
ERH Area Sampling Monthly vapor sampling from VMP wells. Bi-weekly ERH GW sampling.										Bi-weekly ERH GW sampling											
Plant Process & Groundwater Sampling **Weekly** - influent (SP-201), pre primary carbon (SP-204), post primary carbon (SP-206), effluent (SP-208), post T-101 moisture separator (SP-210), post T-201 (SP-212), and GW manifolds (SP-213 through SP-215); **Weekly** well field sampling of physical parameters per SAP (SP-203, 204, 205); ROI of VES for SSVs and select extraction wells. **Quarterly** - SP-209 (Discharge Permit - next Nov. 12&13). **Quarterly** Site-Wide GW Sampling Dec. 3.	QRTLY Permit Sampling	QRTLY Permit Sampling	Weekly GW Sampling							Weekly GW Sampling							Weekly GW Sampling				
Plant Process & Vapor Sampling SSV reduction from 10 locations to 3 locations, to be performed for next 2-3 weeks, prior to next review. **Daily** - plant influent (SP-102) via Reg. 9 Lab TO-15 regular. **Weekly** - all major headers (influent & effluent) Reg. 9 lab; SP-104 - post FTO & SP-109 post carbon for TO-15 (Reg 9) and TO-15 SIM (Air Toxics). ROI vapor measurements for ERH well field.		Weekly Vapor Sampling							Weekly Vapor Sampling							Weekly Vapor Sampling					
FTO Dioxin Test Dioxin sampling on hold until Nov., contingent on total halogenated concs. approx 500 ppmv.																					
C-Zone Sampling & Activities Bi-weekly Sampling									Bi-weekly C-Zone sampling												
WEB Site Optimization Continuing with comments. Performed retroactive flow correction. Calculation need to be QC'd by JW & DC inorder to remove this task from the list.																					
Solar Panel Construction & Rebate Application Rebate application is pending until California Solar Engineering gets paid required by rebate requirements.																					
EPA Visits, Filming Activity, and Community Meeting Next Community Meeting is January 31st.																					

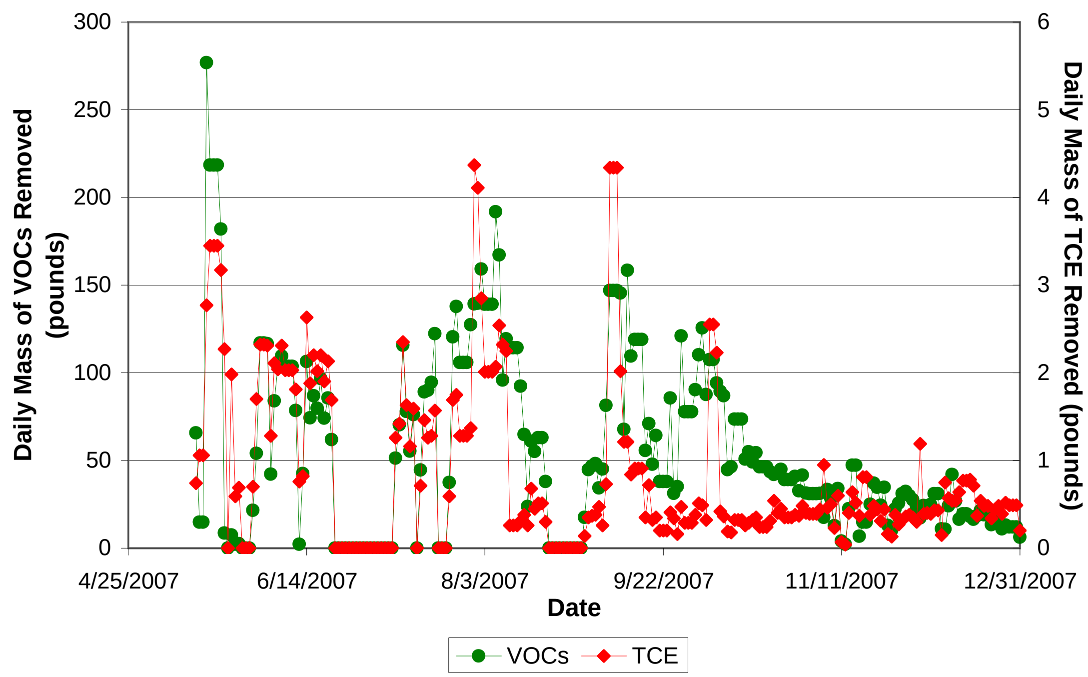
Notes:

BMP - best management practices; ERH - electrical resistance heating; FTO - flameless thermal oxidizer; GAC - granular activated carbon; GW - groundwater; O&M - operation and maintenance; TBD - to be determined; VMP - vacuum monitoring probe

GRAPHS

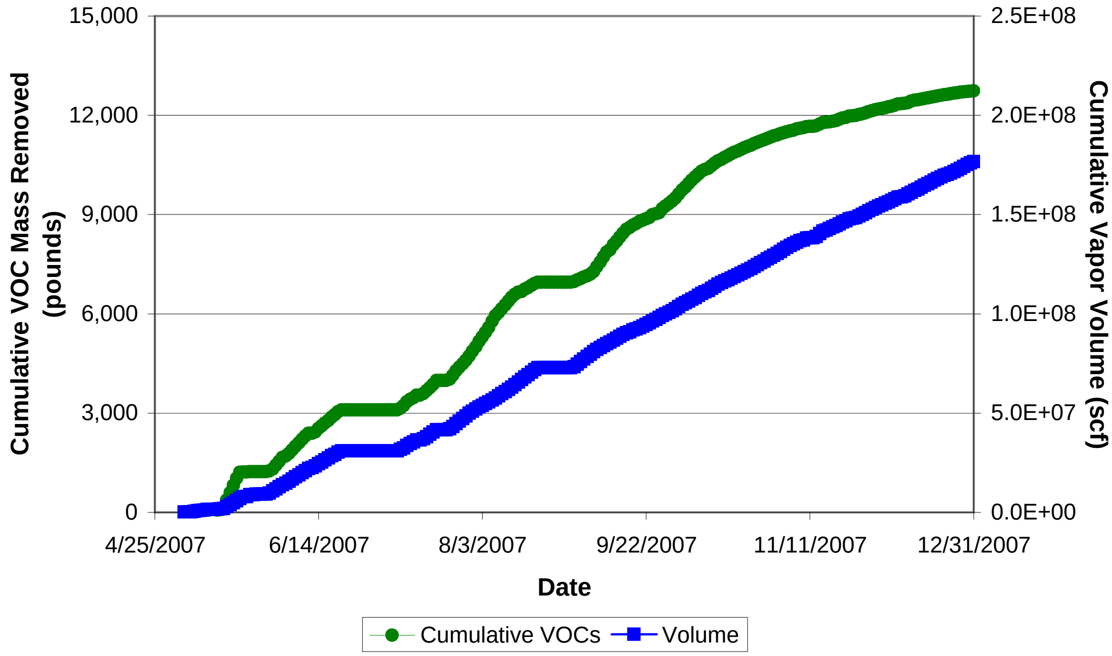
Graph 3.1
Vapor Influent VOC Concentrations and VOC Mass Removal Trends
Pemaco Superfund Site, Maywood, CA

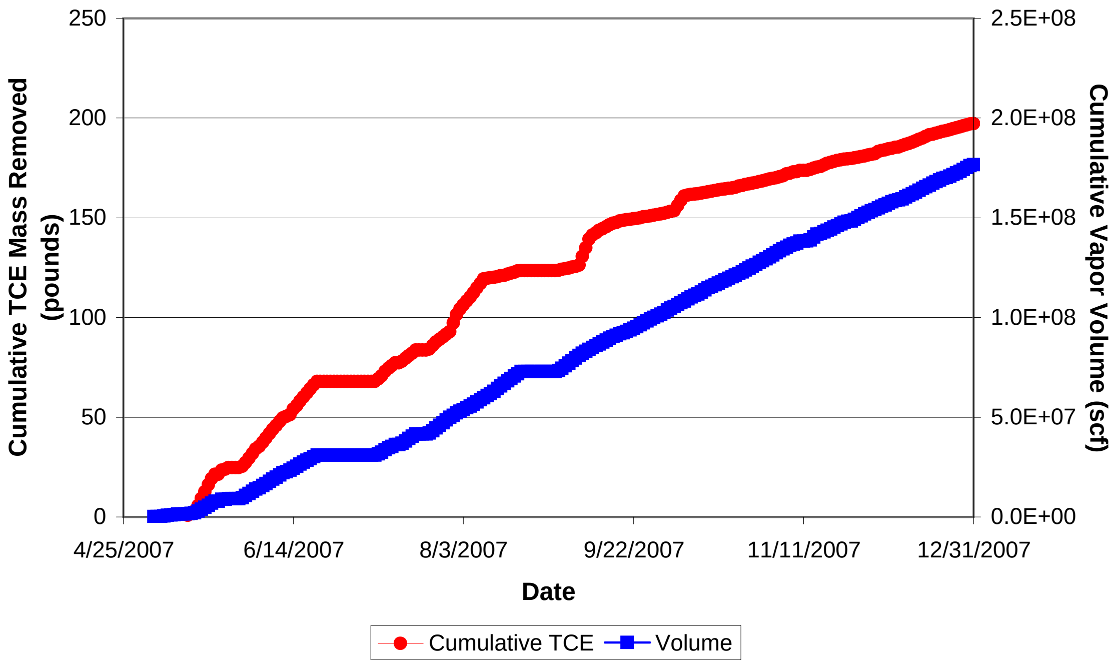




Notes:
TCE - trichloroethane
VOCs - volatile organic compounds
ppbv - part per billion by volume

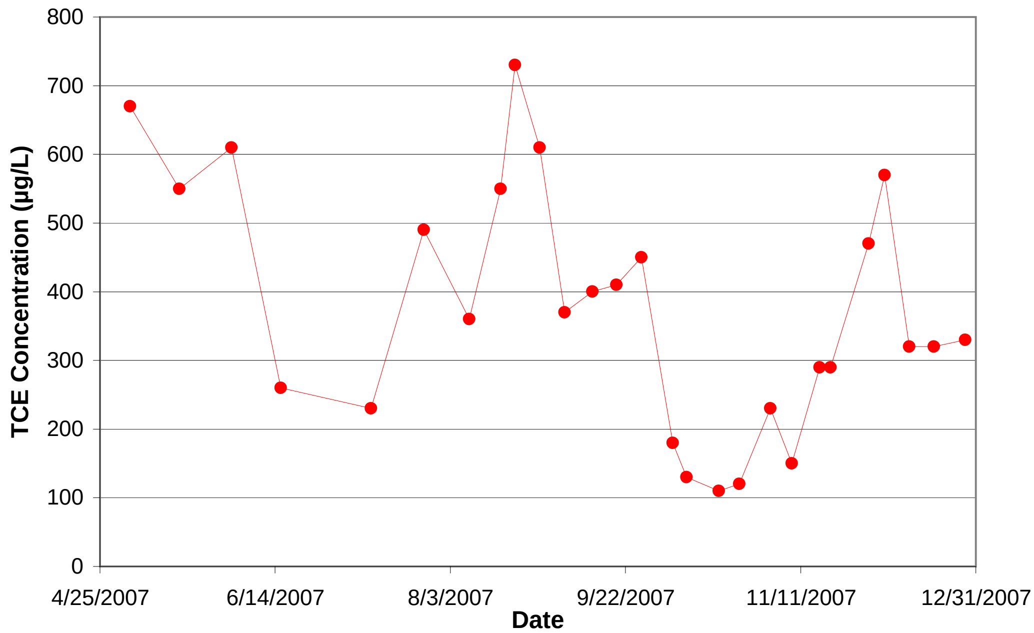
Graph 3.2
Vapor Extraction Volumes and Cumulative VOC Mass Removal
Pemaco Superfund Site, Maywood, CA

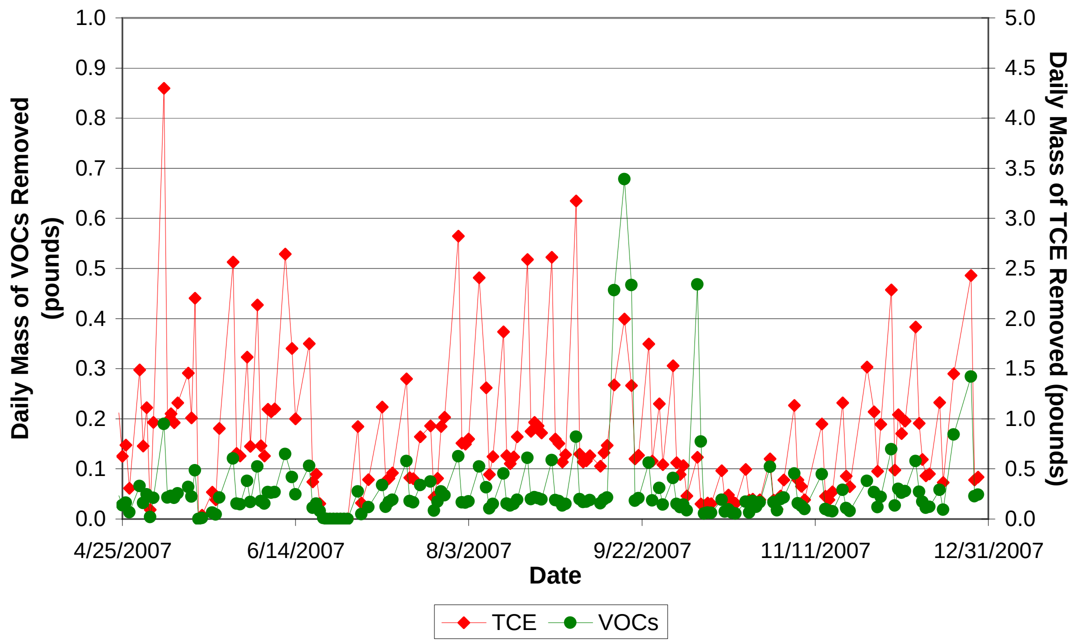




Notes:
TCE - trichloroethane
VOCs - volatile organic compounds
scf - standard cubic feet

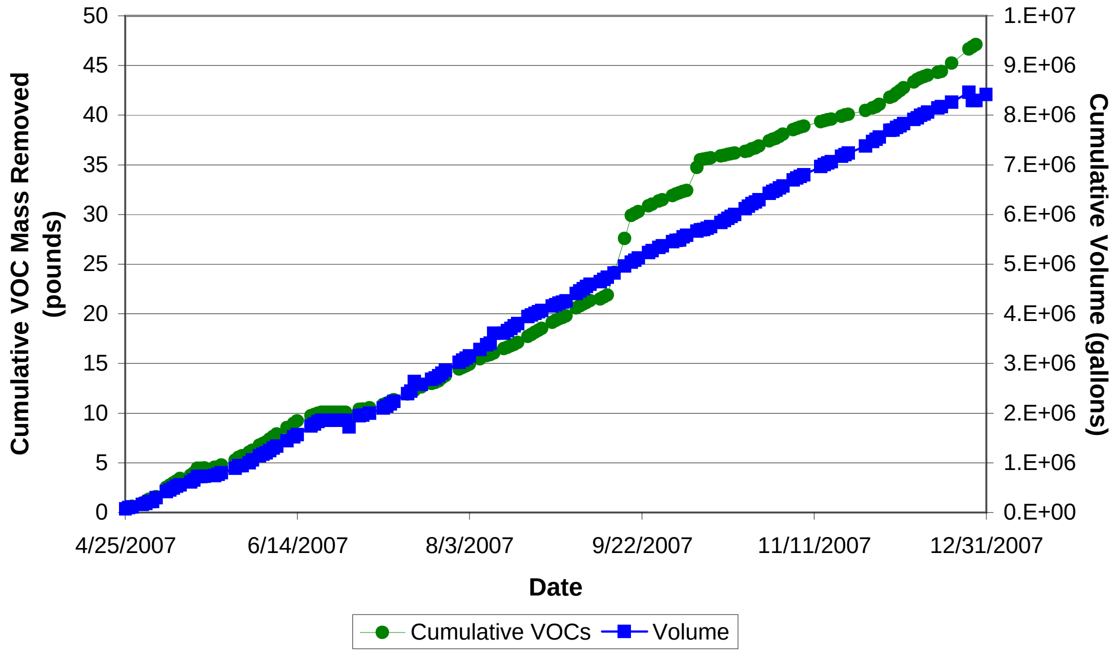
Graph 4.1
Groundwater Influent VOC Concentrations and VOC Mass Removal Trends
Pemaco Superfund Site, Maywood, CA

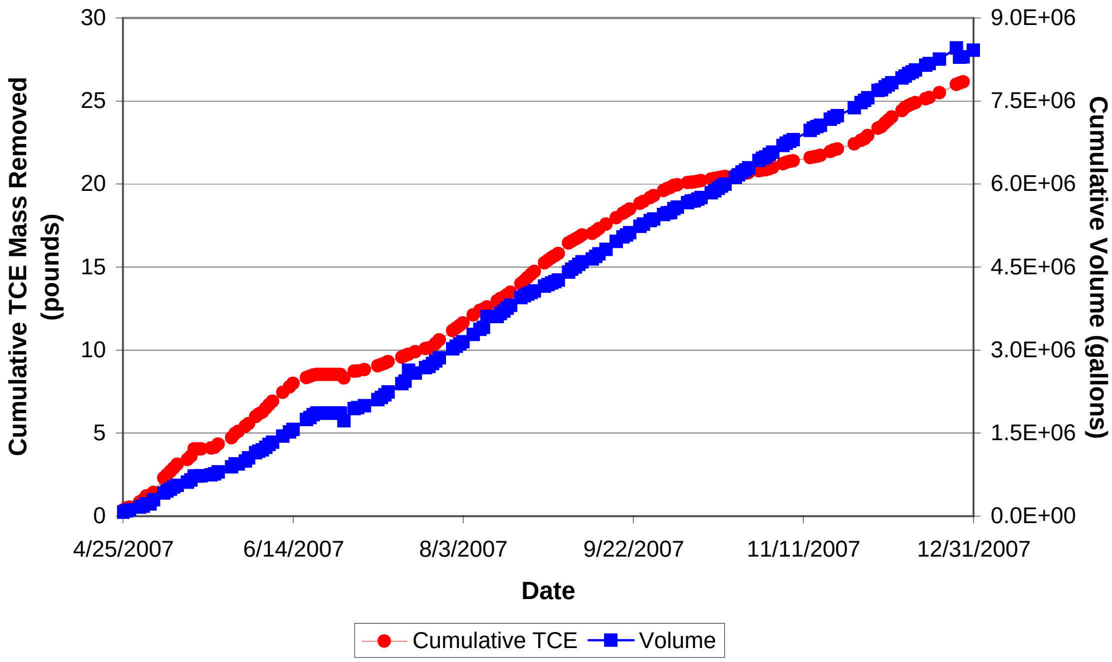




Notes:
TCE - trichloroethane
VOCs - volatile organic compounds
µg/L - microgram per liter

Graph 4.2
Groundwater Extraction Volumes and Cumulative VOC Mass Removal
Pemaco Superfund Site, Maywood, CA





Notes:
TCE - trichloroethane
VOCs - volatile organic compounds