SDMS DOCID# 1110539

"Wallin, Sharon"
<WallinSL@cdm.com>
01/19/2007 07:58 PM

To Christopher Lichens/R9/USEPA/US@EPA
cc LParnass@dtsc.ca.gov, tperina@ch2m.com, Ed Modiano <edm@demaximis.com>, "Lavelle, James" <LavelleJM@cdm.com>, "Tzou, Kassandra"
bcc
Subject Risk Assessment Report

History: This message has been forwarded.

Chris - the Risk Assessment Report (text, tables, figures, and Appendix A and B) is attached in it's entirety, as a pdf file. Hard copies will follow next week.

Regards, Sharon

PS - Hope your email (and others) in-box hasn't exploded!!

RA Report_Draft_Jan19_07.pdf

OMEGA CHEMICAL SITE PRP ORGANIZED GROUP
5225 Canyon Crest Drive
Building 200/Suite 253
Riverside, Ca 92507
(951) 222-0387
(951) 222-0389
e-mail: edm@demaximis.com

January 19, 2007

Mr. Chris Lichens
Remedial Project Manager
U.S. Environmental Project Manager Agency-Region IX
75 Hawthrone Street (SFD-7-4)
San Francisco, CA 94105

Re: Risk Assessment Report,
Omega Chemical Superfund Site, Whittier, California

Dear Mr. Lichens:

Enclosed for your review is a copy of the Risk Assessment (RA) Report for the Omega Chemical Superfund Site. This RA report was prepared in accordance with Task 2 of the Statement of Work (SOW) in *Consent Decree No. 00-12471 between the United States Environmental Protection Agency (USEPA) and OPOG* (USEPA, 2001). The Consent Decree was lodged on November 24, 2000 and entered into the US District Court on February 28, 2001.

Should you have any questions, regarding the above, please contact me.

Sincerely,
Omega Chemical Site PRP Organized Group

Edward Modiano
Project Coordinator

cc: Tom Perina, CH2MHIL
Lori Paranass, DTSC
Dave Chamberlin, CDM
Sharon Wallin, CDM

Draft
Human Health Risk Assessment for On-Site Soils

Omega Chemical Superfund Site
Whittier, California

January 19, 2007

Submitted to:

U.S. Environmental Protection Agency
Region IX

Prepared for:

Omega Chemical Site
PRP Organized Group

Prepared by:

CDM
18581 Teller Avenue, Suite 200
Irvine, California 92612

Project No. 10500-37240-T2.0SS.RISK

Contents

Section 1 Introduction 1-1
1.1 Scope and Objectives 1-1
1.2 USEPA Consent Decree 1-1
1.3 Site History 1-1
1.3.1 Owners and Operators 1-1
1.3.2 Facility Processes and Chemical Usage 1-2
1.4 Potential Risk Issues 1-3
1.5 Overview of Risk Assessment Findings 1-5
1.4 Report Organization 1-5
Section 2 Data Analysis and Identification of Chemicals of Potential Concern 2-1
2.1 Data to Support Human Health Risk Assessment 2-1
2.2 Data Evaluation 2-2
2.3 Identification of Chemicals of Potential Concern 2-3
2.3.1 Non-Toxic and Essential Minerals 2-3
2.3.2 Analysis of Ambient Concentrations of Arsenic 2-4
2.3.2 Frequency of Detection 2-4
2.3.3 Health Based Screening Criteria 2-5
2.3.4 Selection of COPCs for Soil 2-7
2.3.5 Selection of COPCs for Groundwater 2-7
2.3.6 Selection of COPCs for Soil Gas 2-7
2.3.7 Selection of COPCs for Indoor and Ambient Air 2-8
Section 3 Exposure Assessment 3-1
3.1 Exposure Assessment Process 3-1
3.2 Site Setting 3-2
3.3 Site Conceptual Exposure Model 3-3
3.3.1 Potentially Exposed Populations 3-4
3.3.1.1 Commercial/Industrial Workers 3-5
3.3.1.2 Construction Workers 3-5
3.3.2 Potential Exposure Pathways 3-5
3.3.2.1 Ingestion and Dermal Contact with Groundwater 3-6
3.3.2.2 Incidental Ingestion and Dermal Contact with Contaminated Surface Soil and Inhalation of Particulates Released from Surface Soil 3-6
3.3.2.3 Incidental Ingestion of Subsurface Soils, Dermal Contact with Subsurface Soils, and Inhalation of Particulates Released from Subsurface Soils 3-6
3.3.2.4 Inhalation of Contaminants in Indoor Air 3-7
3.3.2.5 Inhalation of Indoor Air – Volatilization during Groundwater Use 3-7
3.3.2.6 Inhalation of Ambient Air 3-7
3.4 Exposure Parameter Assumptions 3-8
3.4.1 General Exposure Assumptions 3-8
3.4.1.1 Body Weight 3-8
3.4.1.2 Body Surface Area 3-8

3.4.1.3 Averaging Time 3-8
3.4.1.4 Exposure Frequency 3-9
3.4.1.5 Exposure Duration 3-9
3.4.1.6 Exposure Time 3-9
3.4.2 Pathway-Specific Exposure Assumptions 3-9
3.4.2.1 Soil and Interior Dust Ingestion....3-9
3.4.2.2 Inhalation of Fugitive Dust 3-9
3.4.2.3 Inhalation of Indoor Air....3-10
3.4.2.4 Exposure to Lead 3-11
3.5 Exposure Point Concentrations....3-12
3.6 Chemical Intake 3-12
3.6.1 Ingestion of Soils and Interior Dust 3-13
3.6.2 Dermal Contact with Soils and Interior Dust....3-13
3.6.3 Inhalation of Fugitive Dust 3-14
Section 4 Toxicity Assessment 4-1
4.1 Carcinogens....4-1
4.1.1 Evidence of Carcinogenicity 4-1
4.1.2 Cancer Slope Factors....4-2
4.2 Noncarcinogens 4-3
Section 5 Risk Characterization 5-1
5.1 Risk Equations 5-1
5.1.1 Cancer Risks....5-1
5.1.2 Chronic Non-Cancer Hazards 5-2
5.2 Risk Characterization Results....5-3
5.2.1 Cancer Risks....5-3
Risks Associated With Soil Exposure 5-3
Risks Associated With Indoor Air Exposure....5-3
5.2.2 Chronic Non-Cancer Hazards 5-5
Hazards Associated With Soil Exposure....5-5
Hazards Associated With Indoor Air Exposure 5-6
5.2.3 Risks Associated with Lead Exposure....5-6
5.3 Health Based Risk Goals (HBRGs)....5-7
Section 6 Uncertainties....6-1
6.1 Uncertainties in the Risk Assessment Process 6-1
6.2 Uncertainties in the Database 6-1
6.3 Uncertainties with Exposure Assessment....6-1
6.3.1 Exposure Concentrations 6-2
6.3.2 Exposure Pathways....6-3
6.3.3 Estimates of Indoor Air Concentrations 6-3
6.4 Uncertainties Associated with Toxicity Assessment....6-4
6.5 Uncertainties in Risk Characterization....6-4
Section 7 Summary and Conclusions....7-1
Section 8 References 8-1

Appendix

Appendix A Risk Calculations
Appendix B Arsenic Statistical Evaluation

List of Figures

Figure 1-1 Site Vicinity Map.....1-6
Figure 3-1 Site Conceptual Exposure Model 3-15

List of Tables

Table 2-1 Surface Soil (0 to 1.5 ft bgs) Data - Summary Statistics 2-9
Table 2-2 Subsurface Soil (0 to 30 ft bgs) Data - Summary Statistics 2-10
Table 2-3 Subsurface Soil (32+ ft bgs) Data - Summary Statistics 2-12
Table 2-4 Groundwater Data (2001 to September 2004) - Summary Statistics.....2-13
Table 2-5 Groundwater Data (October 2004 to September 2006) - Summary Statistics.....2-16
Table 2-6 Soil Gas Data 0-6 feet bgs- Summary Statistics.....2-19
Table 2-7 Soil Gas Data 0-6 feet bgs- Summary Statistics – South Parcel - Skateland 2-20
Table 2-8 Soil Gas Data 6+ feet bgs - Summary Statistics 2-21
Table 2-9 Indoor Air Data - Summary Statistics - Site Parcel 2-22
Table 2-10 Indoor Air Data - Summary Statistics – North Parcel 2-23
Table 2-11 Indoor Air Data - Summary Statistics – West Parcel 2-24
Table 2-12 Indoor Air Data - Summary Statistics – South Parcel - Bishop 2-25
Table 2-13 Indoor Air Data - Summary Statistics – South Parcel – LA Carts/Oncology Care.....2-26
Table 2-14 Ambient Air Data - Summary Statistics 2-27
Table 3-1 Summary of Receptors and Pathways of Concern.....2-16
Table 3-2 Exposure Parameters.....3-17
Table 3-3 Summary of Exposure Point Concentrations - Surface Soil (0 to 1.5 ft bgs).....3-18
Table 3-4 Summary of Exposure Point Concentrations – Surface and Subsurface Soil (0 to 30 ft bgs).....3-19
Table 3-5 Summary of Exposure Point Concentrations - Soil Gas Data 0-6 feet bgs – South Parcel - Skateland 3-20
Table 3-6 Summary of Exposure Point Concentrations – Indoor Air – Site Parcel 3-21
Table 3-7 Summary of Exposure Point Concentrations – Indoor Air – North Parcel 3-22
Table 3-8 Summary of Exposure Point Concentrations – Indoor Air – West Parcel 3-23
Table 3-9 Summary of Exposure Point Concentrations – Indoor Air – South Parcel - Bishop.....3-24
Table 3-10 Summary of Exposure Point Concentrations – Indoor Air – South Parcel - LA Carts/Oncology Care 3-25
Table 4-1 Cancer Toxicity Data – Oral/Dermal.....4-5
Table 4-2 Non-cancer Toxicity Data – Oral/Dermal.....4-6
Table 4-3 Cancer Toxicity Data - Inhalation.....4-7
Table 4-4 Non-cancer Toxicity Data - Inhalation.....4-8
Table 5-1 Summary of Chronic Cancer Risks and Chronic Non-Cancer Hazards 5-9
Table 5-2 Summary of Carcinogenic and Non-Carcinogenic HBRGs for COPCs..... 5-10

Table 5-3 Comparison of Carcinogenic and Non-Carcinogenic HBRGs for COPCs to Parcel Maximum Detections.....5-11
Table 6-1 Summary of PCE Indoor Air Data for 2004-2006.....6-6

Section 1
Introduction

1.1 Scope and Objectives

This risk assessment presents an evaluation of potential human health risks and hazards associated with exposure to residual soil and groundwater contamination at the former Omega Chemical site (the Site). The Site is located at 12504/12512 East Whittier Boulevard (Figure 1). Because the Site is located in an urban area that has been developed for decades, provides no suitable habitat, and contaminated subsurface soils are covered with buildings, asphalt, or concrete, ecological impacts from the facility are not expected and are not evaluated.

This Human Health Risk Assessment (HHRA) follows risk assessment guidance from United States Environmental Protection Agency (USEPA) and with accommodations for consistency with similar guidance from California EPA (CalEPA) as necessary. The following documents formed the basis for the HHRA:

- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A).Interim Final.EPA/5401/1-891002.December 1989.
- CalEPA Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities. July 1996.

1.2 USEPA Consent Decree

This HHRA has been prepared in accordance with Task 2 of the Statement of Work in Consent Decree No. 00-12471 between the United States Environmental Protection Agency (USEPA) and the Omega Chemical Site PRP Organized Group (OPOG). The Consent Decree was lodged on November 24, 2000 and entered into the US District Court on February 28, 2001.

Task 2 requires OPOG to "Implement a Vadose Zone Remedial Investigation/ Feasibility Study (RI/FS) For Contaminant Releases On, At, or Emanating From The Omega Property". The Site location and vicinity are illustrated on Figure 1-1. The figure also illustrates the Phase 1a area, where a groundwater remedy is currently being implemented in accordance with Task 1 of the Consent Decree. The groundwater remedy is expected to be operational in mid-2007.

1.3 Site History

The following section is a summary of information regarding previous owners, operations, and known historical chemical use at and in the vicinity of the Site.

1.3.1 Owners and Operators

The subject Site located at 12504/12512 East Whittier Boulevard was first developed in 1951. The Site occupies Los Angeles County Assessor Tract No. 13486, Lots 3 and 4.

The Site is approximately 41,000 square feet (~0.94 acres) in area (200 feet wide x 205 feet long) and contains two structures – an approximate 140 by 50 foot warehouse and an approximate 80 by 30 foot administrative building. A loading dock is also attached to the rear of the warehouse. The exterior areas are concrete-paved and the Site is secured with a perimeter fence and locking gate.

Prior to initial construction of buildings in July 1951, the Site was used for agriculture; apparently the site has never been used for residential purposes. The Site was operated by Sierra Bullets prior to 1963. During operation of the Sierra Bullet facility, a 500-gallon underground storage tank (UST) was utilized for storage of kerosene. The UST was subsequently removed in 1987 by Fred R. Rippy, Inc.

From 1976 to 1991 Omega Chemical Corporation operated a treatment and disposal facility for commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and/or disposal facilities.

Van Owen Holdings LLC of Los Angeles, California purchased the property in 2003. Star City Auto Body occupies the warehouse (12504 Whittier Blvd.) and performs auto body repair and painting on the premises. The auto body shop also leases the small paved parking lot north of the warehouse building for automobile parking. The former administrative building (12512 Whittier Blvd.) and larger paved parking area south of the warehouse have had a variety of tenants since 2003. The former administration building is currently unoccupied, and the parking lot is used for temporary storage of wooden pallets by L&M Pallets on a month-to-month lease basis.

1.3.2 Facility Processes and Chemical Usage

Limited information regarding volumes and types of wastes handled by the Omega Chemical Corporation is available for review. According to the Phase II Close Out Report (Hargis and Associates, England and Associates, October 1, 1996), Omega Chemical Corporation operated the facility for recycling and treatment of spent solvents and refrigerants. Drums and bulk loads of waste solvents and chemicals (primarily chlorinated hydrocarbons and chlorofluorocarbons) from various industrial activities were processed to form commercial products which were returned to generators or sold in the marketplace. An Operation Plan, prepared by Omega Chemical Corporation in 1990 for proposed expansion of the facility, provided a summary of current and proposed facility processes, tank capacities, incoming and facility-generated waste stream characteristics and handling practices, etc.

The majority of the 11 treatment units were located in the general area of the warehouse loading dock. As indicated in the Operation Plan, a total of 27 storage tanks with a combined storage capacity of 109,400 gallons were present at the facility in 1990. Six large, vertical storage tanks were arranged in an L-shaped pattern in the southern corner of the Site. Five process tanks were located in the northern yard, and

were arranged in a linear pattern along the side of the warehouse. The locations of the smaller storage tanks were not indicated in the Operation Plan.

Wastes accepted by Omega Chemical Corporation for recycling were broadly characterized as organic solvents and chemicals, and aqueous wastes with organic waste constituents. Sources of the incoming waste were a wide assortment of manufacturing and industrial processes (petroleum refining, rubber and plastics, chemicals, paper and allied products, furniture and fixture products, lumber and wood products, printing and publishing, textile mill products, food and kindred products, etc.)..

The treatment and transfer activities at Omega resulted in releases of chemicals to soil, soil gas, and groundwater at the Site, as evidenced by the results of previous site investigations (the first conducted in 1985 by LeRoy and Crandall Associates regarding subsurface contamination at the tank farm). Adjacent facilities, including the Terra Pave facility and the former Cal-Air facility (now owned by Medlin & Son), may have also released contaminants to Site media. A removal action was performed at Terra Pave to address lead contamination in soil. It is possible that lead in airborne particulates from Terra Pave were deposited onto surface soils at the Site. Freon 113 results from the portion of the Omega Site nearest the former Cal-Air facility suggest the possibility of an off-site source.

The principal VOCs detected in the soil gas at the Omega site and at the highest concentrations were Freon 113, Freon 11, 1,1,1-TCA and PCE. The most prevalent contaminants detected in soil and groundwater are volatile organic compounds (VOCs), primarily tetrachloroethylene (PCE) and related compounds, trichloroethane (TCA), and freons. Chlorinated methane compounds, including methylene chloride and chloroform, as well as acetone and toluene, are also detected at the downgradient Site boundary and off-Site. No indications of dense non-aqueous phase liquids (DNAPLs) were identified in vadose zone soil; although some groundwater concentrations are indicative of either non-aqueous phase liquids (NAPL) or residual saturation of VOCs within or above the capillary fringe.

Material found within the loading dock sump contained the highest concentrations of VOCs found anywhere on-site. All loading dock sump material was excavated, transported to an USEPA-approved off-Site disposal facility, incinerated, and disposed. No other exposed or near-surface grossly contaminated materials were identified.

1.4 Potential Risk Issues

This HHRA addresses potential risks and hazards associated with residual soil contamination at the site. The HHRA evaluates the current and future use of the site for commercial purposes. Risk issues at the Site may include partitioning of volatile organic compounds (VOCs) from the soil matrix into soil gas and subsequently into ambient and indoor air. Because VOCs may accumulate to some extent indoors, inhalation of indoor air was quantitatively evaluated in the HHRA using measured

indoor air vapor concentrations. In addition to the Omega Site, potential for vapor intrusion was evaluated using indoor air data at the following areas:

- the parcel immediately to the north currently occupied by Medlin & Sons,
- the parcel immediately to the west currently occupied by TerraPave,
- the parcel to the south and west of the site (currently the occupied by the Bishop Company), and
- the parcel south of Bishop Company currently occupied by LA Carts and Oncology Care.

Also, the estimates for possible vapor intrusion for the parcel immediately to the south of the site (formerly the site of the Skateland facility) were based on measured concentrations of VOCs in soil gas since this building is in the process of being demolished.

Inhalation of ambient air was not evaluated for commercial workers because VOCs would be rapidly diluted. However, construction workers who work in areas where air flow is restricted (e.g., excavations), could theoretically be impacted.

In addition, construction workers at the Site may also be in direct contact with contaminated subsurface soil through incidental ingestion or dermal contact. These scenarios are evaluated in the HHRA for soil. The HHRA did not address these scenarios for soil at the above defined separate parcels. Soil data were concentrated on and along the border of the Omega site. The results of the risk assessment using available soil data were used to predict the likelihood of impacts on the surrounding parcels.

Currently, groundwater underlying the Site and in the immediate vicinity is not used for any purpose. Use for potable purposes within this area is also unlikely for the future due to the presence of high concentrations of total dissolved solids (TDS). However, risks from contaminated groundwater could theoretically result from volatilization of groundwater contaminants into ambient and indoor air, this possibility is highly unlikely due to the 30 foot clay layer boundary above the water table..

Currently, no plans exist for residential development at the Site, and the Site location suggests that residential development in areas adjacent to the Site is unlikely. Therefore, residential use of the site is not expected to occur in the future and, residential exposures are not significant risk issues. Section 3 provides a more detailed discussion of current and reasonable future land uses of the site.

1.5 Overview of Risk Assessment Findings

Results of the risk assessment suggest that contaminated soils at the site are unlikely to present a significant threat to either future construction or commercial/industrial workers. Cancer risk estimates fell in the range of less than to somewhat greater than $1x10^{-6}$. Hazard indices slightly exceeded one for commercial/industrial workers and were less than one for construction workers. Exposures to soil are unlikely now and in the future because of current and expected cover of most of the site with hardscape (buildings, concrete, and asphalt).

Possible risks associated with exposure to vapors intruding into indoor air spaces are typically in the upper half of EPA's target risk range of $1x10^{-6}$ to 1×10^{-4} ($1x10^{-5}$ to $8x10^{-5}$). HI estimates fell in the range of less than one to about 5. Risks and hazards were estimated for the Omega site and for several surrounding parcels. VOCs in ambient air may account of 12 to essentially 100 percent of these risks depending on the parcel.

The basis for these risk estimates is provided in detail in the remainder of this report.

1.4 Report Organization

This HHRA was conducted in four phases as defined in Cal EPA and U.S. EPA guidance, including:

- Identification of chemicals of potential concern (COPCs) that exist in sufficient quantities to present a public health risk (Hazard Identification, Section 2)
- Analysis of ways in which people might be exposed to COPCs (Exposure Assessment, Section 3)
- Evaluation of the toxicity of COPCs that may present public health risks (Toxicity Assessment, Section 4)
- Characterization of the magnitude and location of potential health risks for the exposed community (Risk Characterization, Section 5)

Uncertainties, summary and conclusions, and references are provided in Sections 6, 7, and 8, respectively. Rick calculations are provided in Appendix A.

Omega Chemical Superfund Site

CDM

Legend

- Omega Chemical
- Phase Ia Area

N
W E
S

0 100 200 400
Feet

Site and Vicinity Map

Figure 1-1

Section 2
Data Analysis and Identification of Chemicals of Potential Concern

This section presents a summary of data available for the HHRA, a summary of the data evaluation, and the selection of preliminary Chemicals of Potential Concern (COPCs). Chemicals selected as COPCs were evaluated quantitatively. Data used in the HHRA were obtained from recent sampling events conducted by CDM and include soil, soil gas, and indoor and ambient air samples. As previously discussed, groundwater underlying the Site and in the immediate vicinity is currently not used for any purpose nor is it likely to be used for potable use in the future due to high concentrations of TDS. Further, a groundwater remedy is expected to be operational in mid-2007. Groundwater exposure pathways are not directly evaluated in this risk assessment. However, any groundwater vapor off-gassing was considered by the direct collection of indoor air samples or, in the case of the former Skateland parcel, measured concentrations of VOCs in soil gas..

A preliminary data evaluation was performed to determine the usability of existing data for the HHRA. Selection of data used to support quantitative evaluation is based on quality, quantity, comparability (e.g., similar detection limits), and representativeness of data for current site conditions and potential exposures at the site. During data evaluation, a set of data appropriate for use in qualitative and quantitative risk assessment is compiled. These data are then used in selection of COPCs and in estimation of exposure point concentrations used in the calculation of possible chronic daily intake. A more extensive discussion of data quality is provided in the draft On-Site Soils RI Report, which has been submitted concurrently with this document (CDM, January 5, 2007).

2.1 Data to Support Human Health Risk Assessment

During the RI, samples were collected from surface soils, subsurface soils, soil gas, indoor air, and ambient air. Sample location maps and analytical summary tables for all samples collected during the RI are provided in the RI report. Please refer to the figures and tables provided in the RI report for sample locations and a summary of analytical results.

Approximately 208 soil samples of which 8 were duplicates were collected during roughly 13 sampling events from 1995 to 2006. Soil samples were collected at approximately 66 locations at depths up to 120 feet below ground surface (bgs). Soil samples were analyzed for a comprehensive suite of analyses including VOCs, SVOCs, metals and pesticides.

In addition, during the implementation of Task 1 of the Consent Decree, approximately 298 groundwater samples of which 34 were duplicates were collected during roughly 32 sampling events from 1996 to 2006. Groundwater samples were analyzed for a comprehensive suite of analytes including VOCs, SVOCs, and metals.

Only data from groundwater samples collected from October 2004 to September 2006 are used in the qualitative risk analysis. Although groundwater samples were collected as early as 1996, these earlier samples cannot be assumed to be representative of current conditions.

Soil gas samples were collected from a total of 97 locations at depths up to 71 feet bgs. Seven sampling events occurred from 2004 to 2006, and a total of 271 samples (of which 31 were duplicates) were collected. Soil gas samples were collected in Summa canisters and analyzed by an off-site laboratory for VOCs using EPA Method TO-15. Soil gas data were used for qualitative analysis of risk analysis for the site and most surrounding parcels. However, these data were used quantitatively to evaluate vapor intrusion on the south parcel where the former Skateland facility was located.

Sixty-eight indoor air samples (of which 11 are duplicates) were collected from 25 locations during seven sampling events from 2004 to 2006. Thirteen ambient air samples (including one duplicate) were collected from nine locations during four of these sampling events. Air samples were collected in Summa canisters and analyzed by an off-site laboratory for VOCs using EPA Method TO-15, TO-15 SIM, or TO-14.

In conjunction with the soil vapor survey, soil conductivity profiling was performed during the RI using the Membrane Interface Probe (MIP) system. Evaluation of the soil conductivity and lithologic logs indicated the presence of a continuous clay unit underlying the Site and adjacent areas at an approximate depth of 30 feet bgs. This unit, identified in the RI report as the "30-foot clay unit" acts as an impediment to the upward migration of soil vapors emanating from vadose zone soils below the 30-foot clay unit, including off-gassing from groundwater. This unit is described at length in the RI report.

The protocol used and data generated from all of the sampling efforts are discussed in detail in the RI Report.

2.2 Data Evaluation

Chemical data were reviewed to determine overall usability, for assessing potential human health risks. Data were evaluated to assess precision, accuracy, representativeness, completeness, comparability (PARCC parameters) and sensitivity (blanks). Analytical results for data and details of the data quality assessment are presented in the RI Report. This assessment also includes a review of appropriateness of the reporting limits for risk assessment purposes. Data were found to be of high quality and are considered useable for risk assessment purposes.

Data representativeness is one of the most important criteria evaluated when selecting data for use in the quantitative HHRA. Representativeness is the extent to which available data characterize potential exposure conditions for human or ecological receptors. Proper selection of sampling locations, consideration of potential hot spots, assessment of background concentrations, and collection of a sufficient number of samples help maximize data representativeness. The RI data were collected

in contaminated or potentially contaminated areas and in areas where human contact is possible either currently or in the future.

Soil samples were collected throughout the Omega parcel and from variable depths, providing extensive documentation of the nature and extent of contamination at the site. Sampling was somewhat biased toward areas of known or suspected releases, so that the database as a whole is likely to be somewhat biased toward higher levels of contamination; Any such bias should result in overestimation of potential risks.

Indoor air samples were collected in one to several rounds, depending on the parcel as defined in Section 1. Multiple rounds of indoor air sampling help to minimize impact of any seasonal impacts. Moreover, several indoor air samples were collected in each building, from different areas. Multiple samples within a building help to minimize impacts of ventilation on VOC concentrations and help determine if and where building sources (e.g. consumer products) may impact results. Indoor air samples can be characterized as reasonably representative of indoor air quality in buildings on and around the site. Indoor air data may also reflect building sources rather than or in addition to vapors intruding from the subsurface. Thus, indoor air data may be biased by building sources unrelated to VOCs previously released at the Omega site.

2.3 Identification of Chemicals of Potential Concern

General methods for selection of COPCs followed basic USEPA and CalEPA policy of initially including chemicals observed at the site, regardless of potential for human health risk, and putting any risks due to exposure to chemicals at the site in perspective during the risk characterization. In keeping with this policy, all chemicals detected in media at the site were retained as COPCs, with the following few exceptions:

- Inorganic soil constituents that are essential minerals and/or are present only at concentrations consistent with local ambient conditions were eliminated.
- Chemicals detected with a frequency of less than 5 percent, provided that other criteria as described below were met, were eliminated.
- Chemicals without available toxicity criteria were not retained as COPCs.
- Chemicals with maximum concentrations below regulatory health based screening levels were not retained as COPCs.

2.3.1 Non-Toxic and Essential Minerals

Several metals that are generally recognized as non-toxic and are essential minerals will not be addressed in the risk assessment. Eliminated chemicals include calcium, sodium, potassium, magnesium, chloride, fluoride, nitrate, and nitrite. Some essential minerals, such as iron and manganese, were not eliminated in this step. Such metals,

though essential, can be associated with adverse effects and were retained unless eliminated in subsequent COPC selection steps.

2.3.2 Analysis of Ambient Concentrations of Arsenic

Local ambient concentrations of arsenic in soil were assessed using guidance developed by the Department of Toxic Substances Control (DTSC) for selection of inorganic constituents as chemicals of concern (DTSC 1997). For this analysis, soil data for the site are combined into a single data set and plotted on a normal probability plot. Typically, both untransformed and lognormally transformed data are plotted, because the distribution of environmental data often approximates lognormal. These plots and summary data statistics are then evaluated. Where one of the normal probability plots approximates a straight line, the total data range is about an order of magnitude or less, and the coefficient of variation is less than one (i.e., data variability is low), the data are likely to be part of a single, local ambient distribution. Where normal probability plots are clearly non-linear and show one or more "inflection points", more than one population is likely to be present, and only those data that fulfill the above criteria can be considered to represent local ambient conditions. Typically, when inflection points are identified in the plots, data range is greater than an order magnitude, and the coefficient of variation is greater than one and often much higher.

The probability plot of the arsenic soil data from the Omega site is a straight line suggesting a single population of arsenic concentrations. These data likely represent local ambient conditions, not arsenic releases from the site. This conclusion is bolstered by the relatively small data range (0.8 to 21 mg/kg), and the small coefficient of variation (about 0.65). Moreover, the single higher value of 21 mg/kg is an obvious statistical outlier. The next highest arsenic concentration is less than 10 mg/kg along with the remaining 39 soil sample results in the data base. Finally, the distribution of sample locations (as presented in the RI) indicates substantial coverage of the Omega site (41 samples distributed over less than one acre) suggesting that the single higher value does not represent a substantial hotspot. This observation is consistent with the location of the single higher value at the northeast corner of the site parcel. Operations are not known to have been carried out in this location.

Evaluation of arsenic soil data for the site indicates that arsenic is present at local ambient levels at the site. The single higher value in the data set is a statistical outlier and most likely is a data artifact. Data are sufficiently robust to eliminate the possibility that this single value represents a significant hotspot at the site. On this basis, arsenic was eliminated as a COPC at the site. Results of the statistical analysis are provided in Appendix B.

2.3.2 Frequency of Detection

Chemicals that are detected very infrequently at a site are not likely, with few exceptions, to contribute significantly to overall risk. Many chemicals reported in samples collected from soils at the site were in fewer than 5 percent of samples. These

chemicals may not represent a significant release at the site, and may not, in some cases, be site-related. Thus, elimination of these chemicals makes the risk assessment much less cumbersome and much more focused on significant releases at the site. However, prior to eliminating infrequently detected chemicals, several criteria must be met as described below.

Infrequently detected chemicals were not eliminated if they were: 1) known human carcinogens; 2) were detected at very high concentrations compared to minimum levels that could be associated with adverse effects (e.g. OEHHA soil California Human Health Screening Levels [CHHSLs], 2005b); and/or 3) were found at the site in localized "hotspots." Hotspots are defined as relatively small areas with chemical concentrations that are significantly higher than those in surrounding areas. In most, but not all, cases, hotspots correlate with source areas.

Chemicals that were infrequently detected and do not fall into any of the above categories were eliminated from the quantitative assessment. Chemicals eliminated include:

- 1,2-Dichlorobenzene, 1,4-dichlorobenzene, acetone, benzo(g,h,i)perylene, bromoform, cis-1,2-dichloroethene, diethylphthalate, di-n-butylphthalate, di-n-octylphthalate, endrin, trans-1,3-dichloropropene, trans-1,2-dichloroethene, total xylenes, and vinyl acetate in soil, 0 to 30 feet bgs

- 1,2,3-trichloropropane; 1,2,4-trichlorobenzene; 4-chlorotoluene; carbon disulfide; fluorene; isophorone; pentachlorophenol (PCP); phenanthrene; and methyl acetate in groundwater

2.3.3 Health Based Screening Criteria

Chemicals that were detected below regulatory health based screening levels are less likely to contribute significantly to overall risk than those chemicals detected above screening levels. Previous risk analyses conducted on the site data identified key constituents that drive the overall risk. Thus, elimination of chemicals detected at concentrations below screening levels makes the risk assessment much less cumbersome and much more focused on those chemicals that contribute significantly to overall risk. Maximum detected concentrations were used for the comparison and chemicals were eliminated if they fell below the screening level. Chemicals without screening levels were retained as COPCs. Screening criteria used were:

- **Soil –** USEPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (USEPA 2004). To account for potential additivity of exposure to multiple chemicals, one-tenth of the PRG values were used for screening.

- **Groundwater** - EPA Target Groundwater Concentration Corresponding to Target Indoor Air Concentration Where the Soil Gas to Indoor Air Attenuation Factor = 0.001 and Partitioning Across the Water Table Obeys Henry's Law (EPA 2002). This source was selected because the only groundwater pathway of concern at the

site is for migration to indoor air. To account for potential additivity of exposure to multiple chemicals, one-tenth of the target values were used for screening. Screening of groundwater data was conducted to determine if any potential existed for vapor intrusion of VOCs in groundwater. The screening allowed qualitative indication of whether further evaluation of indoor air quality was warranted.

- **Soil gas –** CalEPA's California Human Health Screening Levels (CHHSLs) for Shallow Soil Gas (Vapor Intrusion) for Commercial/Industrial Use (EPA 2005). CHHSLs have only been developed for a small list of chemicals, so comparisons were made directly to the screening levels without an adjustment for multiple chemicals. Screening of soil gas data was conducted to determine if any potential existed for vapor intrusion. The screening allowed qualitative indication of whether further evaluation of indoor air quality was warranted and to help define chemicals of potential concern for the site. VOCs detected above screening levels in soil gas were assumed to be potential indoor air contaminants and were quantitatively evaluated if observed in indoor air above CHHSLs. The former Skateland parcel is an exception. Soil gas data for this parcel were used in quantitative estimates of potential exposure via vapor intrusion.

- **Indoor air** - CalEPA's CHHSLs for Indoor Air for Commercial/Industrial Use (EPA 2005). CHHSLs have only been developed for a small list of chemicals, so comparisons were made directly to the screening levels without an adjustment for multiple chemicals.

Based on this screening step, eliminated chemicals included:

- 1,2-dichlorobenzene; 1,4-dioxane; 4,4-DDD; 4,4-DDE; 4,4-DDT; aluminum; antimony; barium; benzo(a)anthracene; beryllium; butylbenzylphthalate; cadmium; chromium III; chrysene; cobalt; copper; diethylphthalate; di-n-butylphthalate; endrin; fluoranthene; manganese; mercury; molybdenum; nickel; total polychlorinated biphenyls (PCBs); pyrene; silver; thallium; vanadium; and zinc in surface soil, 0 to 1.5 feet bgs

- 1,1,2-Trichloroethane; 1,1-dichloroethane (1,1-DCA); 4,4-DDD; 4,4-DDE; 4,4-DDT; aluminum; antimony; barium; benzene; benzyl alcohol; beryllium; butylbenzylphthalate; cadmium; chloroform; chromium III; chrysene; cobalt; copper; fluoranthene; isophorone; manganese; mercury; molybdenum; nickel; total PCBs; pyrene; silver; thallium; trichlorofluoromethane; vanadium; and zinc in soil, 0 to 30 feet bgs

- Benzene, , m,p-xylenes, and toluene in soil gas for the Skateland parcel

- 1,1-DCA; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; 2-butanone; 2-methylnapthalene; acetone; acetophenone; chlorobenzene; dichlorodifluoromethane; ethylbenzene; m,p-xylenes; MTBE; n-propylbenzene; o-xylene; sec-butylbenzene; and total xylenes in groundwater

- 1,1,1-Trichloroethane (1,1,1-TCA); m,p-xylenes; and o-xylenes in indoor air for the Site parcel
- 1,1,1-TCA; m,p-xylenes; o-xylenes; and toluene in indoor air for the north and west parcels
- 1,1,1-TCA; MTBE, m,p-xylenes; o-xylenes; toluene; and trichloroethene (TCE) in indoor air for the south-Bishop parcel
- M,p-xylenes; o-xylenes; and TCE in indoor air for the south-LA Carts/Oncology Care parcel

2.3.4 Selection of COPCs for Soil

Because some exposure pathways are limited to surface soil and others to subsurface soil, surface soil and subsurface soil were assessed separately. Surface soil includes samples up to 1.5 feet bgs. Subsurface soil was divided into two categories – 1.5 feet to 30 feet bgs and greater than 32 feet bgs. The 30-foot bgs limit was selected to represent the maximum depth to which construction workers could be exposed in an excavation if the site were to be redeveloped. Since several samples were collected below the 30-foot bgs limit, these samples were included in a separate group to check that no constituents were being overlooked.

Summary statistics for soil data are presented in Tables 2-1, 2-2, and 2-3. These tables show minimum and maximum concentrations, the range of reporting limits, and the detection frequency for all detected constituents in soil. In Table 2-2, subsurface soil from 1.5 to 30 feet bgs were combined with the surface soil data to create a soil data set that represents soil if the site were regraded, mixing surface soil with subsurface soil.

2.3.5 Selection of COPCs for Groundwater

Groundwater samples collected from October 2004 to September 2006 (the last two years) are considered to be more representative of current and future groundwater conditions than samples collected earlier. Summary statistics for groundwater data collected in 2004 through 2006 and presented in Table 2-4. This table shows minimum and maximum concentrations, the range of reporting limits, and the detection frequency for all detected constituents in groundwater. Similar statistics are also presented separately for data collected from 2001 to 2004 (Table 2-5). These statistics help show the variation in groundwater quality over time.

2.3.6 Selection of COPCs for Soil Gas

Soil gas samples were collected from depths of 2 feet bgs to 71 feet bgs in 1990, 1995, 1999, 2004, 2005, and 2006. Since the primary exposure pathway of concern is indoor air, only the more shallow gas samples, 0 to 6 feet bgs, were used in the primary analysis. Also, because soil gas concentrations are likely to change over time, only the more recent soil gas samples (2004 to 2006) are included in the analysis Table 2-6.

Measured indoor air data are used to evaluate all of the indoor air pathways for all of the parcels, except for the former Skateland facility because this building is soon to be demolished. Instead, measured soil gas data were used quantitatively to evaluate vapor intrusion on the south parcel where the former Skateland facility was located. Table 2-7 summarizes the soil gas data quantitatively evaluated for the former Skateland facility.

Because soil gas from deeper samples could in theory represent a source of VOCs at shallow depths, deeper soil gas samples, greater than 6 feet bgs, are presented in Table 2-8. These statistics help ensure that no detected constituent was overlooked in the shallower data. These deeper data were not used in the calculation of exposure point concentrations (Section 3.5).

2.3.7 Selection of COPCs for Indoor and Ambient Air

Indoor and ambient air samples were collected from May 2004 to September 2006. Since indoor air data are evaluated separately by parcel, summaries of indoor air data by parcel are provided in Tables 2-9 through 2-13. Ambient air data are summarized in Table 2-14.

Table 2-1
Summary of Detected Chemicals in Surface Soil Samples (0 to 1.5 feet bgs)

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,2-DICHLOROBENZENE	0.083	0.24	OC-SS-000-20-040604	2	20	0.09	8
1,4-DIOXANE	0.014	14	OC-SS-000-20-040604	10	19	0.03	0.09
2-METHYLNAPHTHALENE	0.48	0.48	OC-SS-000-20-040604	1	22	0.09	8
4,4'-DDD	0.0016	0.032	OC-SS-000-15-040504	2	22	0.0005	0.05
4,4'-DDE	0.001	0.3	OC-SS-000-15-040504	6	22	0.0005	0.05
4,4'-DDT	0.003	0.15	OC-SS-000-16-040504	6	22	0.0005	0.05
ALUMINUM	9585	9830	OC1-000-12-S-0-7	2	2	NR	NR
ANTIMONY	0.6	0.9	OC-SS-000-17-040604, OC-SS-000-19-040604	8	22	6.7	10
ARSENIC	3	21	OCSS-000-01-040504	22	22	1	1
BARIUM	75	210	OC-SS-000-18-040604	22	22	1	1
BENZO(A)ANTHRACENE	0	0	OC-SS-000-09-040504	1	20	0.09	8
BERYLLIUM	0.18	0.52	OC-SS-000-20-040604	22	22	1	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	OC-SS-000-20-040604	8	20	0.2	20
BUTYLBENZYL PHTHALATE	0.85	1.9	OCSS-000-01-040504	2	20	0.09	8
CADMIUM	0.25	2.1	OC1-000-04-S-0-5,OCSS-000-07-040504	22	22	1	1
CALCIUM	6055	7170	OC1-000-12-S-0-7	2	2	NR	NR
CHROMIUM	8.3	360	OC-SS-000-09-040504	22	22	1	1
CHRYSENE	0.038	0.038	OC-SS-000-09-040504	1	20	0.09	8
COBALT	6.3	12	OCSS-000-03-040504	22	22	5	5
COPPER	13	35	OCSS-000-06-040504	22	22	2	2
DIELDRIN	0.0084	0.05	OC-SS-000-15-040504	2	22	0.0005	0.05
DIETHYL PHTHALATE	0.037	0.037	OC-SS-000-14-040504	1	20	0.09	8
DI-N-BUTYLPHTHALATE	0.33	0.33	OC-SS-000-20-040604	1	20	0.09	8
ENDRIN	0	0	OC-SS-000-15-040504	1	22	0.0005	0.05
FLUORANTHENE (IDRYL)	0.033	0.033	OC-SS-000-09-040504	1	20	0.09	8
IRON	22100.0	23200	OC1-000-04-S-0-5	2	2	NR	NR
LEAD	5.0	100	OCSS-000-06-040504	22	22	5	5
MAGNESIUM	5190	5575	OC1-000-04-S-0-5	2	2	NR	NR
MANGANESE	239	353	OC1-000-12-S-0-7	2	2	NR	NR
MERCURY	0.029	0.85	OCSS-000-01-040504	20	22	0.11	0.2
MOLYBDENUM	3	3	OCSS-000-08-040504	1	20	5	5
NAPHTHALENE	1.2	1.2	OC-SS-000-20-040604	1	22	0.09	8
NICKEL	9.2	29.5	OC1-000-04-S-0-5	22	22	1	1
PCB-1254 (AROCLOR 1254)	0.5	0.5	OC-SS-000-16-040504	1	22	0.01	0.035
PHENANTHRENE	0.013	0.03	OC-SS-000-09-040504	2	20	0.09	8
POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	OC-SS-000-16-040504	1	20	0.01	0.02
POTASSIUM	4,350	4,520	OC1-000-12-S-0-7	2	2	NR	NR
PYRENE	0.018	0.044	OC-SS-000-09-040504	2	20	0.09	8
SILVER	0.56	1.2	OCSS-000-06-040504	3	22	1	1
SODIUM	290	320	OC1-000-04-S-0-5	2	2	NR	NR
THALLIUM	0.9	2	OCSS-000-02-040504[1]	14	22	2.8	10
VANADIUM	20	52.5	OCSS-000-08-040504	22	22	1	1
ZINC	34	160	OCSS-000-07-040504	22	22	5	5

1 - Also includes samples OCSS-000-06-040504, OCSS-000-07-040504, OC-SS-000-13-040504, and OC-SS-000-17-040604
2 - Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
mg/kg = milligram per kilogram
NR = not reported

Table 2-2
Summary of Detected Chemicals in Surface and Subsurface Soil Samples (0 to 30 feet bgs)

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,1,1-TRICHLOROETHANE	0.00097	1,200	SB-9-5.9-SOIL-12/13/1995	20	64	0.00083	30
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0072	590	SB-9-5.9-SOIL-12/13/1995	10	64	0.005	100
1,1,2-TRICHLOROETHANE	0.0034	0.011	MIP3-B2-30	6	64	0.0008	50
1,1-DICHLOROETHANE	0.0036	0.013	MIP3-B2-30	6	64	0.0008	50
1,1-DICHLOROETHENE	0.0019	60	SB-9-1.8-SOIL-12/13/1995	16	64	0.0008	50
1,2-DICHLOROBENZENE	0.00088	0.24	OC-SS-000-20-040604	3	84	0.00083	50
1,2-DICHLOROETHANE	0.0032	1.6	SUMP-0.5-SOIL-9/12/96	8	64	0.0008	50
1,4-DICHLOROBENZENE	0.0016	0.0016	MIP3-B2-05	1	84	0.0008	50
1,4-DIOXANE	0.014	41	MIP3-B2-15	18	35	0.025	2.5
2-METHYLNAPHTHALENE	0.48	0.54	SB-15-1.7-SOIL-12/11/1995	2	40	0.09	8
4,4'-DDD	0.0015	0.032	OC-SS-000-15-040504	3	40	0.0005	0.205
4,4'-DDE	0.001	0.3	OC-SS-000-15-040504	6	22	0.0005	0.205
4,4'-DDT	0.003	0.15	OC-SS-000-16-040504	6	22	0.0005	0.205
ACETONE	34	34	SUMP-5-SOIL-9/12/96	1	64	0.0081	1000
ALUMINUM	9,585	9,830	OC1-000-12-S-0-7	2	2	0	0
ANTIMONY	0.6	18	SB-13-1.8-SOIL-12/12/1995	10	40	6.7	10
ARSENIC	0.81	21	OCSS-000-01-040504	40	40	1	1
BARIUM	28	230	SB-13-1.8-SOIL-12/12/1995	40	40	1	1
BENZENE	0.0019	0.0019	MIP3-B2-30	1	64	0.00083	50
BENZO(A)ANTHRACENE	0.032	2.4	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
BENZO(A)PYRENE	1.6	1.6	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZO(B)FLUORANTHENE	0.91	0.91	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZO(G,H,I)PERYLENE	0.49	0.49	SB-15-1.7-SOIL-12/11/1995	1	38	0.09	8
BENZYL ALCOHOL (PHENYLMETHANOL)	5.2	22	SB-9-5.9-SOIL-12/13/1995	2	38	0.09	8
BERYLLIUM	0.18	0.75	SB-12-1.7-SOIL-12/11/1995	40	40	1	1
BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	OC-SS-000-20-040604	13	38	0.2	20
BROMOFORM	0.013	0.013	MIP3-B2-15	1	64	0.004	50
BUTYLBENZYL PHTHALATE	0.85	1.9	OCSS-000-01-040504	2	38	0.09	8
CADMIUM	0.25	2.1	OC1-000-04-S-0-5, OCSS-000-07-040504	22	40	0.5	1
CALCIUM	6,055	7,170	OC1-000-12-S-0-7	2	2	0	0
CHLOROFORM	0.0014	0.013	MIP3-B2-30	10	64	0.0008	50
CHROMIUM	5.6	360	OC-SS-000-09-040504	40	40	1	1
CHROMIUM III [(2)]	4.8	309	OC-SS-000-09-040504	40	40	1	1
CHROMIUM VI [(2)]	0.8	51	OC-SS-000-09-040504	40	40	1	1
CHRYSENE	0.038	6	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
CIS-1,2-DICHLOROETHENE	0.00096	0.0018	OC-SB-GP6-MIP-25-012204	2	64	0.00083	50
COBALT	4.7	16	SB-12-1.7-SOIL-12/11/1995	39	40	4	5
COPPER	13	150	SB-12-1.7-SOIL-12/11/1995	40	40	2	2
DIELDRIN	0.0084	0.05	OC-SS-000-15-040504	2	40	0.0005	0.205
DIETHYL PHTHALATE	0.037	0.037	OC-SS-000-14-040504	1	38	0.09	8
DI-N-BUTYLPHTHALATE	0.33	0.33	OC-SS-000-20-040604	1	38	0.09	8
DI-N-OCTYL PHTHALATE (DIOCTYL PHTHALATE)	0.24	0.24	SB-11-1.8-SOIL-12/14/1995	1	38	0.09	8
ENDRIN	0.032	0.032	OC-SS-000-15-040504	1	40	0.0005	0.305
FLUORANTHENE (IDRYL)	0.033	0.66	SB-15-1.7-SOIL-12/11/1995	2	38	0.09	8
IRON	22,100	23,200	OC1-000-04-S-0-5	2	2	0	0
ISOPHORONE	0.54	9.9	SB-9-1.8-SOIL-12/13/1995	3	40	0.09	8
LEAD	5	890	SB-12-1.7-SOIL-12/11/1995	39	40	5	5
MAGNESIUM	5,190	5,575	OC1-000-04-S-0-5	2	2	0	0
MANGANESE	239	353	OC1-000-12-S-0-7	2	2	0	0
MERCURY	0.029	0.85	OCSS-000-01-040504	21	40	0.1	0.2

Table 2-2
Summary of Detected Chemicals in Surface and Subsurface Soil Samples (0 to 30 feet bgs)

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
METHYLENE CHLORIDE	59	100	SB-9-5.9-SOIL-12/13/1995	2	64	0.005	50
MOLYBDENUM	1.5	4.2	SB-13-1.8-SOIL-12/12/1995	17	38	1	5
NAPHTHALENE	1.2	1.2	OC-SS-000-20-040604	1	56	0.004	8
NICKEL	4.9	55	SB-12-1.7-SOIL-12/11/1995	40	40	1	1
PCB-1254 (AROCLOR 1254)	0.052	0.5	OC-SS-000-16-040504	3	40	0.01	0.06
PHENANTHRENE	0.013	5	SB-15-1.7-SOIL-12/11/1995	3	38	0.09	8
POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	OC-SS-000-16-040504	1	20	0.01	0.02
POTASSIUM	4,350	4,520	OC1-000-12-S-0-7	2	2	0	0
PYRENE	0.018	3.1	SB-15-1.7-SOIL-12/11/1995	3	38	0.09	8
SILVER	0.56	1.2	OCSS-000-06-040504	3	40	1	1
SODIUM	290	320	OC1-000-04-S-0-5	2	2	0	0
TETRACHLOROETHENE	0.0091	1,300	SB-9-1.8-SOIL-12/13/1995	63	64	0.001	0.1
THALLIUM	0.9	2	OCSS-000-02-040504[1]	14	40	2.8	10
TOLUENE	62	62	SB-9-5.9-SOIL-12/13/1995	1	64	0.00083	50
TOTAL ORGANIC CARBON	670	6,000	C-2-15-SOIL-1/30/96	18	18	500	500
TOTAL XYLENES	0.1	0.1	C-3-30-SOIL-2/1/96	1	51	0.0032	200
TRANS-1,2-DICHLOROETHENE	0.0048	0.0103	MIP1-B3-29	2	64	0.0008	50
TRANS-1,3-DICHLOROPROPENE	0.024	0.024	C-3-15-SOIL-2/1/96	1	64	0.0016	50
TRICHLOROETHENE	0.0032	140	SB-9-5.9-SOIL-12/13/1995	21	64	0.001	50
TRICHLOROFLUOROMETHANE (FREON 11)	0.017	220	SB-9-5.9-SOIL-12/13/1995	6	64	0.004	50
VANADIUM	20	71	SB-5-1.8-SOIL-12/11/1995	40	40	1	1
VINYL ACETATE	0.05	0.05	C-3-15-SOIL-2/1/96	1	59	0.0083	500
ZINC	34	350	SB-12-1.7-SOIL-12/11/1995	40	40	5	5

1 - Also includes samples OCSS-000-06-040504, OCSS-000-07-040504, OC-SS-000-13-040504, and OC-SS-000-17-040604.
2 - Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
mg/kg = milligram per kilogram

Table 2-3
Summary of Detected Chemicals in Subsurface Soil Samples (32+ feet bgs)

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum mg/kg	Maximum mg/kg	Maximum Location	Number of Detections	Total Samples	Minimum mg/kg	Maximum mg/kg
1,1,1,2-TETRACHLOROETHANE	0.0013	0.005	MIP3-B2-66	3	67	0.00078	0.25
1,1,1-TRICHLOROETHANE	0.0012	3.1	H-4-75-SOIL-1/30/96	39	91	0.00078	3
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0059	0.98	B-4-75-SOIL-5/23/96	19	91	0.005	5
1,1,2-TRICHLOROETHANE	0.0015	0.14	OC-SB-GP4-MIP-068-012104	17	91	0.00078	3
1,1-DICHLOROETHANE	0.0011	0.03	OC-OU1-2	32	91	0.0007	3
1,1-DICHLOROETHENE	0.006	1.3	H-4-75-SOIL-1/30/96	42	91	0.00084	3
1,2-DIBROMO-3-CHLOROPROPANE	0.016	0.016	OC-OU1-3	1	71	0.0039	0.4
1,2-DICHLOROBENZENE	0.00093	0.0022	OC-OU1-2	2	91	0.00078	3
1,2-DICHLOROETHANE	0.0019	5	H-4-75-SOIL-1/30/96	34	91	0.00078	3
1,4-DIOXANE	0.018	1.5	OC-SB-GP5-MIP-073-012004	11	51	0.025	0.25
ACETONE	0.012	0.95	OC-S-OW1b-70-061699	3	91	0.006	50
BENZENE	0.0011	0.00755	MIP3-B2-57	17	91	0.00078	3
BROMOFORM	0.025	0.025	MIP3-B2-33	1	91	0.0012	3
CHLOROBENZENE	0.0015	0.0015	OC-OU1-2	1	91	0.00078	3
CHLOROFORM	0.0014	3	H-4-110-SOIL-1/30/96	46	91	0.0007	3
CIS-1,2-DICHLOROETHENE	0.0012	0.036	OC-OU1-1	12	91	0.00078	3
DI-ISOPROPYL ETHER (DIPE)	0.00099	0.00099	MIP8-B4-56	1	23	0.00078	0.21
METHYLENE CHLORIDE	0.0065	15	H-4-110-SOIL-1/30/96	15	91	0.005	3
Moisture/Tnfr	16	18	H-4-75-SOIL-1/30/96	2	2	0.00000	0
O-XYLENE	0.0016	0.0016	OC-OU1-5	1	71	0.00078	0.1
TETRACHLOROETHENE	0.002	56	B-4-55-SOIL-5/23/96	89	91	0.00094	1
TETRAHYDROFURAN	0.22	0.22	OC-S-OW1b-60-061699	1	1	0.05	0.05
TOLUENE	0.0013	14	H-4-75-SOIL-1/30/96	7	91	0.00078	3
TOTAL ORGANIC CARBON	510	2,700	GP1-070	35	39	500	500
TOTAL XYLENES	2	4	H-4-110-SOIL-1/30/96	2	37	0.0031	10
TRANS-1,2-DICHLOROETHENE	0.00091	0.06	MIP1-B3-69	18	91	0.00078	3
TRICHLOROETHENE	0.0022	4.2	H-4-75-SOIL-1/30/96	56	91	0.001	3
TRICHLOROFLUOROMETHANE (FREON 11)	0.0031	0.038	MIP-14-B1-34	18	91	0.0039	3

mg/kg = milligram per kilogram

Table 2-4
Summary of Detected Chemicals in Groundwater October 2004 to September 2006

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
1,1,2,2-TETRACHLOROETHANE	ug/l	0.67	0.67	OW-GW-OW-1-082406	1	84	0.5	1,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/l	0.14	2,500	OC-GW-OW8-022305	65	84	0.5	6,300
1,1,2-TRICHLOROETHANE	ug/l	1.3	2,000	OC2-OW1A-W-0-90	11	84	0.5	630
1,1'-BIPHENYL	ug/l	0.8	1.8	OC2-OW4B-W-0-80	2	25	5	5
1,1-DICHLOROETHANE	ug/l	0.31	140	OC-GW-OW8-022305	33	84	0.5	1,000
1,1-DICHLOROETHENE	ug/l	0.28	5,100	OC-GW-OW1-082405	66	84	0.5	1,000
1,2,3-TRICHLOROPROPANE	ng/L	10	65	OC2-OW8-W-0-91	2	83	5	630,000
1,2,4-TRICHLOROBENZENE	ug/l	0.53	5	OC2-MW8D-W-0-110	2	84	0.5	1,000
1,2,4-TRIMETHYLBENZENE	ug/l	3.7	52	OC-GW-OW8-022305	4	58	1	630
1,2-DIBROMO-3-CHLOROPROPANE	ug/l	5.5	5.5	OW-GW-OW-4A-082306	1	84	5	1,000
1,2-DICHLOROBENZENE	ug/l	3	39	OC-GW-OW8-022305	8	84	0.5	1,000
1,2-DICHLOROETHANE	ug/l	0.27	1,200	OC-GW-OW8-022305	33	84	0.5	1,000
1,3,5-TRIMETHYLBENZENE	ug/l	0.815	13	OC-GW-OW8-022305	4	58	1	630
1,3-DICHLOROBENZENE	ug/l	0.61	1.4	OC-GW-OW8-022305	4	84	0.5	1,000
1,4-DICHLOROBENZENE	ug/l	0.58	3.6	OC-GW-OW8-022305	5	84	0.5	1,000
1,4-DIOXANE	ug/l	0.47	13,000	OC2-OW1A-W-0-90	52	84	0.47	5,000
2-BUTANONE	ug/l	1.4	570	OC-GW-OW8-022305	4	30	5	13,000
2-CHLOROTOLUENE	ug/l	0.41	0.47	OW-GW-OW-1-082406	2	58	1	630
2-METHYLNAPHTHALENE	ug/l	0.3	7.9	OC2-OW4B-W-0-80	4	32	5	10
4-CHLOROTOLUENE	ug/l	0.46	0.46	OW-GW-OW-1-082406	1	58	1	630
ACETONE	ug/l	4.4	10,000	OC-GW-OW8-022305	19	84	5	13,000
ACETOPHENONE	ug/l	2.2	2.2	OC2-OW8-W-0-91	1	25	5	5
ANTIMONY	ug/l	1.6	1.9	OC2-OW2-W-0-89[(1)]	25	34	10	60
ARSENIC	ug/l	0.45	17	OC2-OW8-W-0-91	25	34	0.005	0.005
BARIUM	ug/l	19	105	OC2-MW8D-W-0-110	33	33	10	10
BENZENE	ug/l	0.053	180	OC2-OW1A-W-0-90	28	84	0.5	630
BICARBONATE ALKALINITY (AS CACO3)	mg/L	240	540	OW-1	33	33	1	2
BIS(2-ETHYLHEXYL)PHTHALATE	ug/l	0.62	4.6	OC2-MW7A-W-0-102	13	32	5	48
BOD 5 DAY (BIOCHEMICAL OXYGEN DEMAND)	mg/L	2	24	OC2-OW8-W-0-91	26	30	2	2
BORON	ug/l	290	310	OW-8	2	2	100	100
BROMIDE	mg/L	0.17	62	OC2-OW8-W-0-91	26	26	0.5	0.5
BROMODICHLOROMETHANE	ug/l	0.7	1	OC-GW-OW5-022405	3	84	0.5	1,000
BROMOFORM	ug/l	1.2	5.1	OC-GW-OW6-082405	4	84	0.5	1,300
BROMOMETHANE	ug/l	0.062	180	OC2-OW1A-W-0-90	7	84	0.5	1,300
CALCIUM	ug/l	62,300	285,000	OC2-OW8-W-0-91	26	26	100	100
CAPROLACTAM	ug/l	0.15	7.7	OC2-OW1B-W-0-83	2	25	5	5
CARBON DISULFIDE	ug/l	0.28	0.28	OC2-OW1B-W-0-83	1	28	0.5	1,000
CARBON TETRACHLORIDE	ug/l	0.094	0.6	OC-GW-OW1-022505	5	84	0.5	1,000
CHEMICAL OXYGEN DEMAND	mg/L	3.6	81	OC2-OW8-W-0-91	22	30	10	20
CHLORIDE	mg/L	40	370	OC2-OW8-W-0-91	31	31	5	10
CHLOROBENZENE	ug/l	1.6	7.6	OC-GW-OW8-022305	7	84	0.5	1,000
CHLORODIBROMOMETHANE	ug/l	0.54	16	OC-GW-OW5-082305	7	56	1	200
CHLOROFORM	ug/l	0.054	2,750	OC-GW-OW8-022305	63	84	0.5	630
CHLOROMETHANE	ug/l	0.63	8.7	OC2-MW8D-W-0-110	5	84	0.5	1,300
CHROMIUM	ug/l	0.28	146	OC2-MW8A-W-0-107	32	34	5	10
CHROMIUM VI	ug/l	1.9	160	OC2-MW8A-W-0-107	21	26	1	1
CIS-1,2-DICHLOROETHENE	ug/l	0.19	51	OC2-MW1A-W-0-98	37	84	0.5	1,000
COBALT	ug/l	0.15	5	OC2-OW4A-W-0-81	25	34	10	20
COPPER	ug/l	0.32	79	EW4-091406	25	34	2	10
CYANIDE	ug/l	1.9	5.4	OC2-MW1A-W-0-98	6	25	10	10
CYCLOHEXANE	ug/l	0.32	2.1	OC2-OW4B-W-0-80	3	26	0.5	1,000

Table 2-4
Summary of Detected Chemicals in Groundwater October 2004 to September 2006

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
DICHLORODIFLUOROMETHANE	ug/l	0.19	1.35	OC-GW-OW8a-082405	11	84	0.5	1,300
DIMETHYL PHTHALATE	ug/l	0.68	0.68	OC2-OW8-W-0-91	1	32	5	10
ETHYLBENZENE	ug/l	0.051	41	OC-GW-OW8-022305	12	84	0.5	1,000
FLUORENE (ALPHA-DIPHENYLENEMETHANE)	ug/l	0.31	0.31	OC2-OW4B-W-0-80	1	32	5	10
FLUORIDE	mg/L	0.17	0.55	OC2-OW4B-W-0-80	25	25	NR	NR
HARDNESS (AS CACO3)	mg/L	560	840	OW-8	8	8	1	4
IRON	ug/l	42	2,620	OC2-OW8-W-0-91	13	33	40	100
ISOPHORONE	ug/l	2.2	2.2	OC2-OW8-W-0-91	1	32	5	10
ISOPROPYL ALCOHOL (ISOPROPANOL)	ug/l	140	140	OC-GW-OW1B-022505	1	1	50	50
ISOPROPYLBENZENE	ug/l	0.095	6.7	OC-GW-OW8-022305	11	84	0.5	1,000
LEAD	ug/l	0.02	75	EW4-091406	18	34	1	5
M,P-XYLENES	ug/l	0.63	130	OC-GW-OW8-022305	6	58	1	630
MAGNESIUM	ug/l	38,200	95,200	OC2-OW8-W-0-91	26	26	20	20
MANGANESE	ug/l	0.31	4,010	OC2-OW8-W-0-91	29	33	10	20
MBAS (DETERGENTS) (SURFACTANTS)	mg/L	0.36	0.36	OC-GW-OW8a-082405	1	1	0.1	0.1
MERCURY	ug/l	0.03	0.22	OW-8	9	33	0.2	0.2
METHYL ACETATE	ug/l	1,300	1,300	OC2-OW8-W-0-91	1	26	0.5	1,000
METHYL CYCLOHEXANE	ug/l	0.47	2.4	OC2-OW4B-W-0-80	3	26	0.5	1,000
METHYL TERT-BUTYL ETHER	ug/l	0.18	5.7	OC2-MW5A-W-0-97	20	84	0.5	1,000
METHYLENE CHLORIDE	ug/l	0.25	9,150	OC-GW-OW8-022305	22	84	0.5	13,000
MOLYBDENUM	mg/L	0.073	0.073	OC-GW-OW3B-031306	1	9	20	20
NAPHTHALENE	ug/l	0.21	20	EW2-091306	13	83	1	200
NICKEL	ug/l	0.9	50.5	OC2-OW5-W-0-86	25	34	10	20
NITRATE (AS N)	mg/L	1.3	21	OC2-MW5A-W-0-97	27	27	0.15	0.30
NITRITE (AS N)	mg/L	0.24	0.5	OC2-OW8-W-0-91	4	25	0.1	0.25
N-NITROSODIMETHYLAMINE	ng/L	3.1	680	OC2-OW8-W-0-91	6	37	1.9	10,000
N-PROPYLBENZENE	ug/l	0.35	5.7	OC-GW-OW8-022305	6	56	1	200
O-XYLENE	ug/l	0.25	76.5	OC-GW-OW8-022305	9	58	1	630
PENTACHLOROPHENOL (PCP)	ug/l	0.3	0.3	OC2-OW8-W-0-91	1	32	5	20
PERCHLORATE	ug/l	1.3	7.6	OC2-MW7A-W-0-102	24	25	1	1
PH	SU	6.57	6.8	OW-1	3	3	1	1
PHENANTHRENE	ug/l	0.069	0.069	OC2-OW8-W-0-91	1	32	5	10
PHENOL	ug/l	8.5	11	OW-8	2	32	5	10
P-ISOPROPYLTOLUENE	ug/l	0.29	0.86	OC-GW-OW8-022305	4	58	1	630
POTASSIUM	ug/l	2300	8140	OC2-MW10A-W-0-104	8	26	500	500
SEC-BUTYLBENZENE	ug/l	0.29	0.39	OC-GW-OW8-022305	4	58	1	630
SELENIUM	ug/l	1	19	/8D-W-0-110, OC2-MW7A-	26	33	5	10
SODIUM	ug/l	61,500	176,001	OC2-MW7A-W-0-102	26	26	500	500
SPECIFIC CONDUCTANCE (UMHO/CM X 10-6)	umhos/cm	1,800	1,800	OC-GW-OW8a-082405	1	1	1	1
SULFATE	mg/L	150	660	OC2-OW6-W-0-82	28	28	2.5	10
TETRACHLOROETHENE	ug/l	0.21	170,000	OC-GW-OW1-022505	84	84	1	5,000
TETRAHYDROFURAN	ug/l	540	650	OC-GW-OW8-022305	2	2	50	50
THALLIUM	mg/L	0.028	0.028	OC-GW-OW8a-082405	1	34	1	10
TOLUENE	ug/l	0.073	1,300	OC-GW-OW8-022305	14	84	0.5	630
TOTAL ALKALINITY (AS CACO3)	mg/L	240	540	OW-1	32	32	1	2
TOTAL DISSOLVED SOLIDS	mg/L	660	1,500	OC2-MW7A-W-0-102[(2)]	34	34	10	50
TOTAL KJELDAHL NITROGEN (ORGANIC NITRO)	mg/L	0.16	1	OC2-OW8-W-0-91	10	25	0.15	0.15
TOTAL ORGANIC CARBON	mg/L	4.7	74	OC2-OW1A-W-0-90	27	31	1	1
TOTAL PHOSPHORUS	mg/L	0.32	0.32	OC2-OW1B-W-0-83	1	25	0.15	0.15
TOTAL XYLENES	ug/l	0.055	4.6	OC2-OW4B-W-0-80	4	26	0.5	1,000
TRANS-1,2-DICHLOROETHENE	ug/l	0.32	98	OC2-OW8-W-0-91	28	84	0.5	1,000

Table 2-4
Summary of Detected Chemicals in Groundwater October 2004 to September 2006

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
TRICHLOROETHENE	ug/l	0.16	10,000	OC-GW-OW1-082405	73	84	0.5	1,000
TRICHLOROFLUOROMETHANE (FREON 11)	ug/l	0.18	1,000	OC-GW-OW2-02206	63	84	0.5	1,300
VANADIUM	ug/l	0.35	10	OC-GW-OW3B-031306	26	34	10	10
VINYL CHLORIDE	ug/l	0.775	0.78	OC-GW-OW8-022305	2	84	0.5	1,000
ZINC	ug/l	0.45	570	EW4-091406	28	34	2	20

mg/l = milligram per liter
ug/l = microgram per liter
ng/l = nanogram per liter
NR - Not reported

(1) Also includes OC2-OW6-W-0-82, OC2-MW4C-W-0-95, OC2-MW5A-W-0-97
(2) Also includes OC2-OW6-W-0-82, OC2-OW8-W-0-91

Table 2-5
Summary of Detected Chemicals in Groundwater 2001 to September 2004

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
1,1,1,2-TETRACHLOROETHANE	ug/l	1.7	32	OC-GW-OW1-021903	10	95	0.2	400
1,1,1-TRICHLOROETHANE	ug/l	0.055	10,250	OC-GW-OW1-082704	58	153	0.2	1,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/l	0.35	2,800	OC2-OW8-W-0-29	118	153	0.5	2,000
1,1,2-TRICHLOROETHANE	ug/l	0.35	150	OC2-OW8-W-0-29	18	153	0.2	1,000
1,1-DICHLOROETHANE	ug/l	0.25	130	OW-GW-OW1-051601	47	153	0.2	1,000
1,1-DICHLOROETHENE	ug/l	0.23	2,700	OW-GW-OW1-051601	131	153	0.5	400
1,2,3-TRICHLOROPROPANE	ng/L	2.4	87	OC2-OW8-W-0-29	18	136	2	400,000
1,2,4-TRIMETHYLBENZENE	ug/l	0.8	11	OW8-112003	2	95	0.2	400
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	ug/l	50	88	OC-GW-OW8-082202	4	3	25	50
1,2-DICHLOROBENZENE	ug/l	1.2	15	OC-GW-OW1-021903	10	153	0.2	1,000
1,2-DICHLOROETHANE	ug/l	0.24	805	OC-GW-OW8-031103	50	153	0.2	1,000
1,2-DICHLOROPROPANE	ug/l	0.62	1.6	OC2-MW4A-W-0-25	2	153	0.2	1,000
1,3,5-TRIMETHYLBENZENE	ug/l	2.4	2.4	OW8-112003	1	95	0.2	400
1,3-DICHLOROBENZENE	ug/l	0.48	0.77	OC-GW-OW1-022404	4	153	0.2	1,000
1,4-DICHLOROBENZENE	ug/l	0.089	3	OC-GW-OW1-021903	7	153	0.2	1,000
1,4-DIOXANE	ug/l	0.5	52,280	OC-GW-OW1-021903	88	129	0.5	5,050
2,6-DINITROTOLUENE	ug/l	0.18	0.18	OC2-MW1A-W-0-45	1	66	5	10
2-BUTANONE	ug/l	0.83	770	OC2-OW8-W-0-29	5	63	2	10,000
2-CHLOROTOLUENE	ug/l	0.28	0.6	OC1-OW1-W-0-3	3	95	0.2	400
4-NITROPHENOL	ug/l	1.6	1.6	OC2-MW4A-W-0-58, OC2-MW4B-W-0-59	2	66	20	100
ACETONE	ug/l	3	11,000	OC2-OW8-W-0-29	35	153	2	10,000
ACETOPHENONE	ug/l	6.9	6.9	OC2-OW8-W-0-29	1	58	5	10
ALUMINUM	ug/l	47	87	OC2-MW9B-W-0-43	4	58	10	200
AMMONIA NITROGEN (AS N)	mg/L	0.23	0.29	OC2-OW1A-W-0-34	2	58	0.15	0.15
ANTIMONY	ug/l	0.18	0.37	OC2-MW4B-W-0-23	4	66	0.19	60
ARSENIC	ug/l	0.53	65	OC2-OW8-W-0-29	53	66	0.5	4
BARIUM	ug/l	10	136	OW-GW-OW1-051601	65	66	1	4
BENZENE	ug/l	0.051	88	OC2-OW1A-W-0-34	46	153	0.2	200
BENZO(B)FLUORANTHENE	ug/l	0.13	0.13	OC2-MW7A-W-0-73	1	66	5	10
BENZO(K)FLUORANTHENE	ug/l	0.55	0.55	OC2-MW4C-W-0-39	1	66	5	10
BICARBONATE ALKALINITY (AS CACO3)	mg/L	200	570	OC2-OW1A-W-0-34	58	58	NR	NR
BIS(2-ETHYLHEXYL)PHTHALATE	ug/l	2.5	80	OC2-MW5A-W-0-41	32	66	5	50
BOD 5 DAY (BIOCHEMICAL OXYGEN DEMAND)	mg/L	2	77	OC2-OW8-W-0-29	25	58	2	2
BORON	ug/l	120	680	OC2-MW7A-W-0-20	17	17	NR	NR
BROMIDE	mg/L	0.14	70	OC2-OW8-W-0-29	58	58	NR	NR
BROMOFORM	ug/l	0.3	0.95	OC2-MW4C-W-0-39	3	153	0.2	1,000
BROMOMETHANE	ug/l	2.5	2.5	OC2-MW8D-W-0-72	1	153	0.2	1,000
CADMIUM	ug/l	0.075	2.7	OC-GW-OW1-081701	3	66	0.07	5
CALCIUM	ug/l	49,500	285,999	OC2-OW8-W-0-29	58	58	NR	NR
CAPROLACTAM	ug/l	2	28	OC2-OW1A-W-0-34	5	58	5	10
CARBON DISULFIDE	ug/l	0.02	240	OC2-OW1A-W-0-34	5	59	0.5	50
CARBON TETRACHLORIDE	ug/l	0.073	1.1	OC-GW-OW6-021502	21	153	0.2	1,000
CHEMICAL OXYGEN DEMAND	mg/L	3.8	301	OC2-OW8-W-0-29	35	58	5	10
CHLORIDE	mg/L	43	370	OC2-OW8-W-0-29	58	58	NR	NR
CHLOROBENZENE	ug/l	0.75	500	OC2-OW1A-W-0-34	15	153	0.2	400
CHLOROETHANE	ug/l	0.2	0.2	OC1-OW1-W-0-23	1	153	0.2	1,000
CHLOROFORM	ug/l	0.046	2,000	OC-GW-OW8-031103	114	153	0.5	400
CHLOROMETHANE	ug/l	0.4	8.55	OC2-MW1A-W-0-45	17	153	0.2	1,000
CHROMIUM	ug/l	0.55	160	OC2-MW8A-W-0-12	58	66	0.35	4
CHROMIUM (VI)	ug/l	0.65	177	OC2-MW8A-W-0-12	56	65	NR	1
CHRYSENE	ug/l	0.69	0.69	OC2-MW4C-W-0-39	1	66	5	10

Table 2-5
Summary of Detected Chemicals in Groundwater 2001 to September 2004

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
CIS-1,2-DICHLOROETHENE	ug/l	0.14	97	OC-GW-OW5-022103	68	153	0.2	1,000
COBALT	ug/l	0.08	8.2	OW-GW-OW1-051601	32	66	0.12	50
COPPER	ug/l	0.44	11.3	OC-GW-OW1-021402	37	66	0.5	25
CYANIDE	ug/l	3.4	3.4	OC2-OW1A-W-0-34	1	65	5	25
CYCLOHEXANE	ug/l	1	16	OC2-MW5A-W-0-66	2	59	0.5	1,000
DICHLORODIFLUOROMETHANE	ug/l	0.19	7.7	OW8-112003	14	153	0.5	2,000
DI-N-BUTYLPHTHALATE	ug/l	0.54	1	OC2-MW5A-W-0-9, OC2-MW4A-W-0-5	4	66	5	20
DISSOLVED ORGANIC CARBON	mg/L	1.1	52	OC-GW-OW1-021903	7	7	1	5
ETHANE	ng/L	41.5	3,200	OC-GW-OW1-021903	3	3	5	5
ETHENE	ng/L	1,200	1,500	OC-GW-OW1B-021903	3	3	5	5
ETHYLBENZENE	ug/l	0.085	15	OC2-OW8-W-0-29	10	153	0.2	1,000
FLUORIDE	mg/L	0.14	0.6	OC2-MW4B-W-0-23	58	58	NR	NR
IRON	ug/l	33	3,350	OC2-OW1B-W-0-33	17	58	50	100
ISOPHORONE	ug/l	4.9	4.9	OC2-OW8-W-0-29	1	66	5	10
ISOPROPYL ALCOHOL (ISOPROPANOL)	ug/l	350	940	OW-GW-OW4B-051601	4	4	200	200
ISOPROPYLBENZENE	ug/l	1	2.4	OC1-OW1-W-0-3	7	153	0.2	1,000
LEAD	ug/l	0.07	2.9	OW-GW-OW1B-051601	23	66	0.07	10
M,P-XYLENES	ug/l	0.3	44	OW8-112003	7	95	0.2	400
MAGNESIUM	ug/l	36,500	99,999	OC2-OW8-W-0-29	58	58	NR	NR
MANGANESE	ug/l	0.48	2,490	OC2-OW8-W-0-29	23	58	1	15
MERCURY	ug/l	0.02	0.2	OC-GW-OW1b-021402	11	64	0.015	0.4
METHANE	ug/l	4.6	2,400	OC-GW-OW1B-021903	3	3	0.015	0.015
METHYL TERT-BUTYL ETHER	ug/l	0.12	270	OW-GW-OW6-051601	37	152	0.2	1,000
METHYLENE CHLORIDE	ug/l	0.089	8,600	OC2-OW8-W-0-29	36	153	0.2	2,000
MOLYBDENUM	ug/l	1.4	136	OC-GW-OW1b-111601	24	25	0.5	6
NAPHTHALENE	ug/l	0.43	0.6	OC1-OW1-W-0-3	3	153	0.2	400
NICKEL	ug/l	1.2	75	OW-GW-OW1-051601	53	66	1	40
NITRATE (AS N)	mg/L	0.17	20	OC2-MW5A-W-0-66 (1)	64	65	0.11	0.55
NITRATE-NITRITE AS NITROGEN	mg/L	3.7	11	OC-GW-OW4A-022003(2)	6	7	0.15	0.75
NITRITE (AS N)	mg/L	0.06	1	OC-GW-OW1B-021903	5	65	0.05	0.75
N-NITROSODIMETHYLAMINE	ng/L	2.5	900	OC2-OW8-W-0-29, OC1-OW1-W-0-3	17	58	2	21
N-PROPYLBENZENE	ug/l	0.42	0.7	OC1-OW1-W-0-23	4	95	0.2	400
O-XYLENE	ug/l	0.55	27	OC-GW-OW8-082404	9	95	0.2	400
PERCHLORATE	ug/l	1.2	10	OC2-MW7A-W-0-20	58	73	1	4
PHENOL	ug/l	20	20	OC2-OW8-W-0-29	1	66	5	10
P-ISOPROPYLTOLUENE	ug/l	0.32	0.7	OC1-OW1-W-0-3	4	95	0.2	400
POTASSIUM	ug/l	1,860	5,420	OC2-MW11A-W-0-77	37	58	2500	2,500
SEC-BUTYLBENZENE	ug/l	0.26	1.4	OC-GW-OW6-021502	2	95	0.2	400
SELENIUM	ug/l	1.1	227	OC2-OW8-W-0-29	53	66	1	35
SILICA (SAME AS SI AS SIO2)	ug/l	25,000	46,000	OC2-MW1A-W-0-1	17	17	NR	NR
SODIUM	ug/l	57,000	167,501	OC2-MW7A-W-0-73	58	58	NR	NR
SULFATE	mg/L	95	670	OC2-MW7A-W-0-20	58	58	NR	NR
TETRACHLOROETHENE	ug/l	0.97	210,000	OC1-OW1-W-0-23	149	153	0.5	2,500
THALLIUM	ug/l	0.08	9.65	OC2-MW1A-W-0-45	14	66	1	4
TOLUENE	ug/l	0.092	880	OC-GW-OW8-031103	28	153	0.2	400
TOTAL ALKALINITY (AS CACO3)	mg/L	200	570	OC2-OW1A-W-0-34	58	58	NR	NR
TOTAL DISSOLVED SOLIDS	mg/L	630	1,700	OC2-MW7A-W-0-20	58	58	NR	NR
TOTAL INORGANIC CARBON	ug/l	1.1	1.1	OC1-OW1-W-0-23	1	1	NR	NR
TOTAL KJELDAHL NITROGEN (ORGANIC NITRO)	mg/L	0.16	0.46	OC2-OW1A-W-0-34	8	58	0.15	0.15
TOTAL ORGANIC CARBON	mg/L	1.1	70	OC2-OW8-W-0-29	44	58	1	1
TOTAL XYLENES	ug/l	75	75	OC2-OW8-W-0-29	1	58	0.5	1,000

Table 2-5
Summary of Detected Chemicals in Groundwater 2001 to September 2004

Chemical	Units	Detections			Detection Frequency		Reporting Limits	
		Minimum	Maximum	Maximum Location	Number of Detections	Total Samples	Minimum	Maximum
TRANS-1,2-DICHLOROETHENE	ug/l	0.495	130	OC2-OW8-W-0-29	30	153	0.2	1,000
TRICHLOROETHENE	ug/l	0.31	3,600	OC-GW-OW1-022404	138	153	0.5	400
TRICHLOROFLUOROMETHANE (FREON 11)	ug/l	0.15	995	OC-GW-OW8-022003	114	153	0.5	1,000
VANADIUM	ug/l	0.41	17.2	OC-GW-OW1-081701	33	66	1	10
VINYL CHLORIDE	ug/l	0.5	0.9	OC1-OW1-W-0-23	4	153	0.2	1,000
ZINC	ug/l	1	260	OC-GW-OW1b-021402	34	66	1.6	80

(1) Also includes OC-GW-OW2-021903 and OC-GW-OW1-021903
(2) Also includes OC-GW-OW2-021903, OC-GW-OW1-021903
NR - Not reported
mg/l = milligram per liter
ug/l = microgram per liter
ng/l = nanogram per liter

Table 2-6
Summary of Detected Chemicals in Soil Gas 0 to 6 feet bgs

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	6.4	280000	OC-SG-006-VP08-081905	23	46	1	7700
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	450000	OC-SG-06-01-041204	46	46	1	15000
1,1,2-TRICHLOROETHANE	260	260	OC-SG-006-VP02-082205	1	46	1	1900
1,1-DICHLOROETHANE	9	26000	OC-SG-006-VP05-081705	20	46	1	4100
1,1-DICHLOROETHENE	21	270000	OC-SG-06-03-041204	46	46	1	5600
1,2,4-TRIMETHYLBENZENE	2	94	OC-SSD-SH-3F-092205	10	46	1	1900
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	64	15000	OC-SG-06-03-041204	5	5	NR	NR
1,2-DICHLOROETHANE	23	2500	OC-SG-006-VP08-081905	5	46	1	1900
1,3,5-TRIMETHYLBENZENE	5.7	36	OC-SSD-SH-3F-092205	8	46	1	1900
2,2,4-TRIMETHYLPENTANE	3.1	12	UC-10	5	24	1.4	1600
2-BUTANONE	2.6	55	OC-SSD-SH-2I-092105	4	44	1	1600
4-ETHYLTOLUENE	1.8	28.75	OC-SSD-SH-4F-092205	10	44	1	1600
ACETALDEHYDE	54	54	OC-SG-006-VP19-121305	1	1	NR	NR
ACETONE	19	8900	OC-SG-006-VP08-081905	23	44	1	6400
BENZENE	2.6	650	OC-SG-006-VP05-081705	18	46	1	1900
CARBON DISULFIDE	3.6	8400	OC-SG-006-VP08-081905	11	44	1	1600
CARBON TETRACHLORIDE	37	37	OC-SG-006-VP11-081505	1	46	1	1900
CHLOROFORM	2.5	3000	OC-SG-006-VP04-082205, OC-SG-006-VP05-081705	22	46	1	1900
CIS-1,2-DICHLOROETHENE	2.5	9300	OC-SG-006-VP10-081505	16	46	1	1900
CYCLOHEXANE	4.7	150	OC-SSD-SH-4F-092205	4	32	1	1600
DICHLORODIFLUOROMETHANE	2.8	1900	OC1-SG14A-G-0-28	15	46	1	1600
ETHYLBENZENE	1.8	900	OC-SSD-SH-3I-092105	9	46	1	1900
HEPTANE	2.4	290	OC-SSD-SH-4F-092205	3	32	1	1600
HEXANE (N-HEXANE)	3	230	OC-SSD-SH-4F-092205	2	32	1	1600
M,P-XYLENES	3.2	3800	OC-SSD-SH-3I-092105	13	46	1.4	3800
O-XYLENE	2.5	1600	OC-SSD-SH-3I-092105	10	46	1	1900
TETRACHLOROETHENE	61	500000	OC-SG-006-VP08-081905	46	46	1	7700
TETRAHYDROFURAN	5.3	30	OC-SSD-SH-1I-092105	8	32	1	1600
TOLUENE	7.8	1700	OC-SSD-SH-3I-092105	20	46	1	1900
TRANS-1,2-DICHLOROETHENE	2.6	5300	OC-SG-006-VP04-082205	17	44	1	1600
TRICHLOROETHENE	36	88000	OC-SG-06-03-041204	46	46	1	5500
TRICHLOROFLUOROMETHANE (FREON 11)	98	180000	OC-SG-06-03-041204	46	46	1	11000
VINYL ACETATE	84	84	OC-SSD-SH-2I-092105	1	32	1	6400

NR - Not reported
ppbv = parts per billion volume

Table 2-7
Summary of Detected Chemicals in Soil Gas 0 to 6 feet bgs for South Parcel - Skateland

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	330,000	OC1-SG14A-G-0-28	7	7	1.4	670
1,1-DICHLOROETHENE	21	210,000	OC1-SG14A-G-0-28	7	7	1.4	670
1,2,4-TRIMETHYLBENZENE	3	3	UC-4B	1	7	1.4	1,900
2,2,4-TRIMETHYLPENTANE	4.2	12	UC-10	3	6	1.4	670
2-BUTANONE	2.6	2.6	UC-4B	1	6	1.4	670
4-ETHYLTOLUENE	2.4	2.4	UC-4B	1	6	1.4	670
ACETONE	35	78	SG-15-6FT	4	6	5.8	2,700
BENZENE	2.6	5.1	SG-15-6FT	2	7	1.4	1,900
CARBON DISULFIDE	3.6	3.6	UC-4B	1	6	1.4	670
CHLOROFORM	2.5	2.5	UC-4B	1	7	1.4	1,900
DICHLORODIFLUOROMETHANE	2.8	1,900	OC1-SG14A-G-0-28	5	7	1.4	670
HEXANE (N-HEXANE)	3	3	UC-10	1	6	1.4	670
M,P-XYLENES	3.2	7	SG-15-6FT	3	7	1.4	3,800
TETRACHLOROETHENE	140	13,000	OC1-SG14A-G-0-28	7	7	1.4	670
TOLUENE	7.8	690	SG-14-6FT	4	7	1.4	1,900
TRICHLOROETHENE	36	7,800	OC1-SG14A-G-0-28	7	7	1.4	670
TRICHLOROFLUOROMETHANE (FREON 11)	98	94,000	OC1-SG14A-G-0-28	7	7	1.4	670

ppbv = parts per billion volume

Table 2-8
Summary of Detected Chemicals in Soil Gas 6+ feet bgs

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	36	450,000	OC-SG-018-VP08-081905	91	194	0.78	11,000
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1	560,000	OC-SG-058-VP18-121505	189	194	1	29,000
1,1,2-TRICHLOROETHANE	60	240	OC-SG-024-VP02-082205, OC-SG-018-VP02-082205	8	194	0.78	4,100
1,1-DICHLOROETHANE	6	22,000	OC-SG-012-VP05-081705	101	194	0.78	4,100
1,1-DICHLOROETHENE	1.2	870,000	OC-SG-051-VP14-121505	184	194	0.7	15,000
1,2,4-TRIMETHYLBENZENE	1.7	6.8	OC-SG-018-VP19-121305	16	194	0.8	4,100
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	480	13,000	OC-SG-12-03-041204	10	10	NR	NR
1,2-DICHLOROETHANE	7.8	35,000	OC-SG-070-VP06-081605	34	194	0.78	4,100
1,3,5-TRIMETHYLBENZENE	2	26	OC-SG-060-VP11-081505	2	194	0.78	4,100
1,3-BUTADIENE	1.3	92.5	OC-SG-060-VP27-053106	24	110	1	2,500
1,4-DIOXANE	6.5	6.5	OC-SG-036-VP25-030606	1	110	4	9,900
2,2,4-TRIMETHYLPENTANE	1	3,100	OC-SG-050-VP15-121405	26	110	1	2,500
2-BUTANONE	1.5	140	OC-SG-040-VP19-121305	34	185	1	2,500
2-HEXANONE	660	660	OC-SG-040-VP04-082205	1	185	1.6	9,900
2-PROPANOL	5.3	15,000	OC-SG-029-VP13-121205	14	110	4	9,900
4-ETHYLTOLUENE	1.3	8.5	OC-SG-018-VP19-121305	12	185	0.78	2,500
4-METHYL-2-PENTANONE	1	3.8	OC-SG-025-VP25-030606	3	185	1	2,500
ACETALDEHYDE	59	250	OC-SG-040-VP19-121305	5	5	NR	NR
ACETONE	6.5	14,500	OC-SG-060-VP02-082205	111	186	1	9,900
BENZENE	0.9	2,500	OC-SG-040-VP05-081705	70	194	0.78	4,100
BROMODICHLOROMETHANE	1.4	3.6	OC-SG-008-VP30-060106	4	185	0.78	2,500
BROMOFORM	1.3	1.3	OC-SG-010-VP26-053106	1	185	0.78	2,500
CARBON DISULFIDE	1	14000	OC-SG-070-VP04-082205	80	185	0.78	2,500
CARBON TETRACHLORIDE	20	52	OC-SG-060-VP11-081505	5	194	0.78	4,100
CHLOROFORM	1.2	37000	OC-SG-058-VP14-121505	113	194	0.78	4,100
CHLOROMETHANE	0.78	0.87	OC-SG-040-VP10-081505	2	194	0.78	9,900
CIS-1,2-DICHLOROETHENE	13	9,500	OC-SG-018-VP10-081505	43	194	0.78	4,100
CYCLOHEXANE	1.2	5,100	OC-SG-050-VP15-121405	21	110	1	2,500
DIBROMOCHLOROMETHANE	1.1	2	OC-SG-010-VP26-053106	2	185	0.78	2,500
DICHLORODIFLUOROMETHANE	1.4	3,100	OC-SG-035-VP24-030606	33	194	0.78	4,100
ETHANOL	6.4	135	OC-SG-12-01-041204	17	110	4	9,900
ETHYLBENZENE	1.3	7	OC-SG-018-VP19-121305	16	194	0.78	4,100
HEPTANE	1.2	2,600	OC-SG-050-VP15-121405	27	110	1	2,500
HEXANE (N-HEXANE)	1.1	10000	OC-SG-050-VP15-121405	38	110	1	2,500
M,P-XYLENES	2.3	160	OC-SG-060-VP11-081505	36	194	1	8,100
METHYL TERT-BUTYL ETHER	5.3	12	OC-SG-036-VP25-030606	3	185	1	2,900
METHYLENE CHLORIDE	1.4	18,000	OC-SG-060-VP03-082205	49	194	0.8	4,100
O-XYLENE	1	800	OC-SG-018-VP08-081905	27	194	0.78	4,100
PENTANE	7300	91,000	OC-SG-050-VP15-121405	2	2	NR	NR
TETRACHLOROETHENE	1.6	900,000	OC-SG-058-VP14-121505	182	194	0.7	15,000
TETRAHYDROFURAN	1	1,300	SG-8-18FT	3	110	1	2,500
TOLUENE	1.3	4,000	OC1-SG8A-G-0-25	88	194	0.7	4,100
TRANS-1,2-DICHLOROETHENE	8.9	20,000	OC-SG-070-VP04-082205	74	185	0.78	2,500
TRICHLOROETHENE	6.5	110000	OC-SG-058-VP14-121505	173	194	0.78	6,300
TRICHLOROFLUOROMETHANE (FREON 11)	1	220000	OC1-SG11A-G-0-24	189	194	1	14,000
VINYL CHLORIDE	13	140	OC-SG-050-VP06-081605	5	194	0.78	4,100

NR - Not reported
ppbv = parts per billion volume

Table 2-9
Summary of Detected Chemicals in Indoor Air - Site Parcel

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.038	0.06	OC-IA-FS-07-091405	3	8	0.027	4.6
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.21	3.9	OC-AA-FD-07-051104	7	8	0.027	4.6
1,1-DICHLOROETHENE	0.17	4.4	OC-AA-FD-07-051104	7	8	0.027	4.6
ACETONE	10	2500	OC-IA-FD-09-091405	8	8	0.013	4.6
BENZENE	0.81	3.5	OC-IA-FS-14-091405	6	8	2	4.6
CARBON TETRACHLORIDE	0.091	0.11	OC-IA-FS-07-091405	5	8	2	4.6
CHLOROFORM	0.039	0.05	OC-AA-FS-13-051104	2	8	0.027	4.6
DICHLORODIFLUOROMETHANE	0.28	0.62	OC-IA-FS-14-091405	6	8	0.027	4.6
ETHYLBENZENE	0.73	11	OC-AA-FS-09-051104	7	8	0.027	4.6
M,P-XYLENES	3.3	61	OC-AA-FS-09-051104	7	8	0.67	84
METHYLENE CHLORIDE	0.43	74	OC-IA-FS-14-091405	6	8	0.067	8.4
O-XYLENE	0.66	18	OC-AA-FS-09-051104	7	8	0.027	4.6
TETRACHLOROETHENE	0.15	5.1	OC-IA-FS-07-091405	7	8	0.027	4.6
TOLUENE	8.9	620	OC-AA-FS-09-051104	8	8	0.027	4.6
TRICHLOROETHENE	0.046	1.2	OC-IA-FS-07-091405	6	8	2	4.6
TRICHLOROFLUOROMETHANE (FREON 11)	0.35	2.4	OC-AA-FD-07-051104	6	8	0.027	4.6

ppbv = parts per billion volume

Table 2-10
Summary of Detected Chemicals in Indoor Air - North Parcel

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.038	0.038	OC-AA-FS-10-051104	1	5	0.032	0.24
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.25	5.1	OC-AA-FS-10-051104	5	5	0.032	0.24
1,1-DICHLOROETHENE	0.74	2.6	OC-AA-FS-10-091405	4	5	0.016	0.12
1,4-DICHLOROBENZENE	0.034	0.15	OC-AA-FS-10-051104	2	5	0.032	0.24
ACETONE	9.1	1400	OC-AA-FS-10-051104	5	5	0.8	6
BENZENE	0.28	0.33	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4	5	0.08	0.6
CARBON TETRACHLORIDE	0.1	0.13	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4	5	0.032	0.24
CHLOROFORM	0.041	0.066	OC-AA-FS-11-091405	3	5	0.032	0.24
DICHLORODIFLUOROMETHANE	0.25	0.66	OC-AA-FS-10-051104	5	5	0.032	0.24
ETHYLBENZENE	0.17	0.19	OC-AA-FS-10-051104	4	5	0.032	0.24
M,P-XYLENES	0.49	0.62	OC-AA-FS-10-091405	4	5	0.064	0.48
METHYLENE CHLORIDE	0.48	1.4	OC-AA-FS-10-051104	3	5	0.32	2.4
O-XYLENE	0.2	0.23	OC-AA-FS-10-051104	4	5	0.032	0.24
TETRACHLOROETHENE	0.62	3.3	OC-AA-FS-10-091405	4	5	0.032	0.24
TOLUENE	0.73	2	OC-AA-FS-10-091405	5	5	0.032	0.24
TRICHLOROETHENE	0.42	2.5	OC-AA-FS-10-091405	4	5	0.032	0.24
TRICHLOROFLUOROMETHANE (FREON 11)	0.25	2.1	OC-AA-FS-10-091405	5	5	0.032	0.24

NR - Not reported
ppbv = parts per billion volume

Table 2-11
Summary of Detected Chemicals in Indoor Air - West Parcel

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.082	0.088	OC-AA-FS-06-051104	2	4	0.032	0.037
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.83	3.4	OC-AA-FS-05-051104	4	4	0.032	0.037
1,1-DICHLOROETHENE	1.4	5.7	OC-AA-FS-05-051104	4	4	0.016	0.018
1,4-DICHLOROBENZENE	0.038	0.045	OC-IA-FD-05-091405	2	4	0.032	0.037
ACETONE	9.2	18	OC-AA-FS-06-051104	4	4	0.79	0.92
BENZENE	0.36	0.45	OC-AA-FS-06-051104	4	4	0.079	0.092
CARBON TETRACHLORIDE	0.087	0.11	OC-IA-FD-05-091405	4	4	0.032	0.037
CHLOROFORM	0.042	0.048	OC-AA-FS-05-051104	4	4	0.032	0.037
DICHLORODIFLUOROMETHANE	0.3	0.58	OC-AA-FS-05-051104	4	4	0.032	0.037
ETHYLBENZENE	0.21	0.36	OC-AA-FS-05-051104	4	4	0.032	0.037
M,P-XYLENES	0.75	1.2	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.063	0.073
METHYLENE CHLORIDE	0.35	0.43	OC-AA-FS-05-051104	4	4	0.32	0.37
O-XYLENE	0.22	0.47	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.032	0.037
TETRACHLOROETHENE	5.7	15	OC-AA-FS-05-051104	4	4	0.032	0.037
TOLUENE	1.7	2.6	OC-AA-FS-05-051104	4	4	0.032	0.037
TRICHLOROETHENE	0.3	0.8	OC-AA-FS-05-051104	4	4	0.032	0.037
TRICHLOROFLUOROMETHANE (FREON 11)	0.61	1.2	OC-AA-FS-05-051104,OC-AA-FS-06-051104	4	4	0.032	0.037

ppbv = parts per billion volume

Table 2-12
Summary of Detected Chemicals in Indoor Air - South Parcel - Bishop

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.036	0.036	OC-IA-BIS-STORE-090806	1	3	0.03	0.062
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.44	1.3	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
1,1-DICHLOROETHENE	0.9	3.6	OC-IA-BIS-STORE-090806	3	3	0.015	0.031
1,4-DICHLOROBENZENE	0.036	0.053	OC-IA-BIS-AO-090806	2	3	0.03	0.062
ACETONE	12	17.35	OC-IA-BIS-AO-090806	3	3	0.74	1.6
BENZENE	0.355	0.39	OC-IA-BIS-STORE-090806	3	3	0.074	0.16
CARBON TETRACHLORIDE	0.081	0.091	OC-IA-BIS-AO-090806	3	3	0.03	0.062
CHLOROFORM	0.032	0.036	OC-IA-BIS-STORE-090806	2	3	0.03	0.062
DICHLORODIFLUOROMETHANE	0.55	0.605	OC-IA-BIS-AO-090806	3	3	0.03	0.062
ETHYLBENZENE	0.19	0.4	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
M,P-XYLENES	0.615	1.1	OC-IA-BIS-STORE-090806	3	3	0.06	0.12
METHYL TERT-BUTYL ETHER	0.19	0.19	OC-IA-BIS-STORE-090806	1	3	0.15	0.31
METHYLENE CHLORIDE	0.29	0.49	OC-IA-BIS-STORE-090806	2	3	0.3	0.62
O-XYLENE	0.23	0.39	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TETRACHLOROETHENE	1	4.3	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TOLUENE	1.8	2.2	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TRICHLOROETHENE	0.083	0.28	OC-IA-BIS-STORE-090806	3	3	0.03	0.062
TRICHLOROFLUOROMETHANE (FREON 11)	0.39	0.65	OC-IA-BIS-STORE-090806	3	3	0.03	0.062

ppbv = parts per billion volume

Table 2-13
Summary of Detected Chemicals in Indoor Air - South Parcel - LA Carts/Oncology Care

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.092	1.9	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16
1,1-DICHLOROETHENE	0.015	0.92	OC-IA-LAC-Sm Prod-090806	5	5	0.013	0.082
1,2-DICHLOROETHANE	0.08	0.08	OC-IA-ONC-NS-090806	1	5	0.027	0.16
1,4-DICHLOROBENZENE	0.028	0.065	OC-IA-ONC-NS-090806	2	5	0.027	0.16
ACETONE	31	490	OC-IA-LAC-Sm Prod-090806	5	5	0.67	4.1
BENZENE	0.36	0.68	OC-IA-LAC-Lg Prod-090806	5	5	0.067	0.41
CARBON TETRACHLORIDE	0.079	0.083	OC-IA-ONC-AO-090806	4	5	0.027	0.16
CHLOROFORM	0.029	0.14	OC-IA-ONC-AO-090806	4	5	0.027	0.16
DICHLORODIFLUOROMETHANE	0.52	0.68	OC-IA-ONC-NS-090806	5	5	0.027	0.16
ETHYLBENZENE	0.22	0.47	OC-IA-LAC-Lg Prod-090806	5	5	0.027	0.16
M,P-XYLENES	0.67	1.7	OC-IA-LAC-Lg Prod-090806	5	5	0.054	0.33
METHYLENE CHLORIDE	1.5	1.7	OC-IA-LAC-Lg Prod-090806	2	5	0.27	1.6
O-XYLENE	0.24	0.59	OC-IA-LAC-Lg Prod-090806	5	5	0.027	0.16
TETRACHLOROETHENE	0.036	0.24	OC-IA-LAC-Lg Prod-090806	3	5	0.027	0.16
TOLUENE	2.8	150	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16
TRICHLOROETHENE	0.22	0.22	OC-IA-LAC-AO-090806	1	5	0.027	0.16
TRICHLOROFLUOROMETHANE (FREON 11)	0.26	0.57	OC-IA-LAC-Sm Prod-090806	5	5	0.027	0.16

ppbv = parts per billion volume

Table 2-14
Summary of Detected Chemicals in Ambient Air

Chemical	Detections			Detection Frequency		Reporting Limits	
	Minimum ppbv	Maximum ppbv	Maximum Location	Number of Detections	Total Samples	Minimum ppbv	Maximum ppbv
1,1,1-TRICHLOROETHANE	0.21	0.21	OC-AA-FS-08-051104	1	12	0.029	0.18
1,1,2,2-TETRACHLOROETHANE	0.057	0.057	OC-AA-FS-03-051104	1	12	0.029	0.18
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.093	0.23	OC-AA-FS-08-051104	7	12	0.029	0.18
1,1-DICHLOROETHENE	0.033	0.16	OC-AA-FS-08-051104	6	12	0.015	0.092
1,2-DICHLOROBENZENE	0.049	0.049	OC-AA-FS-03-051104	1	12	0.029	0.18
1,4-DICHLOROBENZENE	0.065	0.065	OC-AA-FS-03-051104	1	12	0.029	0.18
ACETONE	6	1600	OC-AA-FS-15-051104	8	11	0.73	4.6
BENZENE	0.25	0.34	OC-AA-FS-04-051104	7	12	0.073	0.46
CARBON TETRACHLORIDE	0.078	0.1	OC-AA-FS-03-091405	7	12	0.029	0.18
DICHLORODIFLUOROMETHANE	0.37	0.67	OC-AA-FS-12-051104,OC AA-FS-24-080404	8	12	0.029	0.18
ETHYLBENZENE	0.1	0.22	OC-AA-FS-04-051104	8	12	0.029	0.18
M,P-XYLENES	0.3	0.72	OC-AA-FS-04-051104	8	12	0.058	0.37
METHYLENE CHLORIDE	0.6	0.6	OC-AA-FS-12-051104	1	12	0.29	1.8
O-XYLENE	0.1	0.275	OC-AA-FS-04-051104	8	12	0.029	0.18
TETRACHLOROETHENE	0.08	0.26	OC-AA-FS-08-091405	7	12	0.029	0.18
TOLUENE	0.98	4.2	OC-AA-BIS-090806	9	12	0.029	0.18
TRICHLOROETHENE	0.042	0.2	OC-AA-FS-08-051104	5	12	0.029	0.18
TRICHLOROFLUOROMETHANE (FREON 11)	0.28	0.35	OC-AA-FS-08-091405	8	12	0.029	0.18

NR - Not reported
ppbv = parts per billion volume

Section 3
Exposure Assessment

Populations that may be exposed to contaminants at a site and pathways by which these populations may come into contact with site contaminants are identified in the exposure assessment. In addition, methods used to quantify potential exposures are presented. The goal of the exposure assessment is to estimate reasonable maximum exposure (RME) and average or central tendency exposure (CTE) for populations that may be exposed to chemicals at the site. RME typically falls within the 90th to 99.9th percentile of possible exposures (EPA, 1993b), and is designed to fall among the highest exposures that are reasonably expected to occur. Estimates for RME typically form the basis for remedial decisions. CTE is based on typical human behavior patterns. Estimates of CTE are generally used to evaluate uncertainties and obtain insights into the range of exposures that may occur.

The reminder of this section discusses evaluation of RME and CTE for people that may use the site currently or in the future after redevelopment. This section is divided into several subsections, as follows:

- Exposure Assessment Process (Section 3.1)
- Site Setting (Section 3.2)
- Site Conceptual Exposure Model (SCEM) (Section 3.3)
- Exposure Parameter Assumptions (Section 3.4)
- Exposure Point Concentrations (Section 3.5)
- Chemical Intake Equations (Section 3.6)

3.1 Exposure Assessment Process

Exposure is defined as human contact with a chemical or physical agent (EPA, 1989). Exposure assessment is the estimation of magnitude, frequency, duration, and pathway(s) of exposure to a chemical. Assessment of exposure consists of three steps:

- Characterization of Exposure Setting
- Identification of Exposure Pathways
- Quantification of Exposure

The first step involves identifying physical characteristics of a site and the current and potential future use of the site by people. These characteristics, along with concentrations and distributions of COPCs, define the exposure setting for current and future human receptors.

Step two of the exposure assessment identifies pathways by which people might be exposed to site-related chemicals. Chemical sources, release and transport mechanisms, and inter-media transfer are evaluated. Exposure pathways are identified based on the location and activities of potentially exposed human receptors and on the types of potentially contaminated media.

The final step, exposure quantification, has two components: estimation of exposure point concentrations and calculation of chemical intake. Exposure point concentrations are chemical concentrations at the point of human contact with site media such as soil and soil gas. Site-specific chemical data from site investigations are used to estimate chemical exposure point concentrations. Summary statistics for available site data, exposure point concentrations, and equations for estimating these concentrations will be presented in the HHRA.

Chemical intake is the amount of chemical contacted per unit of body weight per unit of time, generally expressed as milligrams (mg) of chemical intake per kilogram (kg) body weight per day. Chemical intake is calculated by combining pathway-specific exposure assumptions, such as frequency and duration of exposure, with exposure point concentrations. Pathway-specific exposure assumptions are presented herein; chemical intake calculations are included in appendices to this document. Pathway-specific exposure assumptions used to calculate intake are based on site-specific data (when available) and USEPA and/or CalEPA default exposure assumptions.

3.2 Site Setting

Included in the characterization of the exposure setting is a description of physical characteristics of the site and identification of current and potential future human populations on and near the site as they pertain to potential human exposure.

As previously discussed, the Omega site is located in a commercial/industrial area in Whittier, California. From 1976 to 1991, Omega Chemical Corporation operated a treatment and disposal facility for commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and/or disposal facilities. In 2003, Van Owen Holdings LLC of Los Angeles, California purchased the property. Currently, two buildings (an office building and a warehouse) are located at the relatively flat Site, with concrete paving covering exterior areas. Star City Auto Body occupies the warehouse (12504 Whittier Blvd.) and performs auto body repair and painting on the premises. The auto body shop also leases the small paved parking lot north of the warehouse building for automobile parking. The former administrative building (12512 Whittier Blvd.) and larger paved parking area south of the warehouse have had a variety of tenants since 2003. The former administration building is currently unoccupied, and the parking lot is used for temporary storage of wooden pallets by L&M Pallets on a month-to-month lease basis.

One commercial property (formerly Skateland) and two industrial properties (Medlin & Son and Terra Pave) are immediately adjacent to the Site (southeastern, northwestern, and southwestern boundaries, respectively). The northeastern boundary of the Site is bordered by Whittier Boulevard and a frontage road. Skateland, located at 12520 Whittier Boulevard, consists of an indoor roller skating rink building that is no longer in operation and that will soon be demolished. The Medlin & Son (former Cal-Air facility) facility, located at 12484 Whittier Boulevard, is operated as a machine shop (screw machines, lathes and mills, tapping and threading, saw cutting, welding, etc.).

The Terra Pave, Inc. facility, located at 12511 East Putnam Street, is utilized by a paving contractor. The property is utilized for temporary storage of asphalt paving materials for various job sites. Terra Pave also utilizes the property to park and maintain a variety of support vehicles and heavy-duty paving equipment. New England Lead Burning Company (NELCO), previously operated on the Terra Pave site in the mid-1950s. According to a Phase 1 Environmental Site Assessment (ESA) Report of the property prepared by Cardinal Environmental Consultants (Cardinal) on September 11, 1991, NELCO purchased lead in sheets, pipe and solid rods and fabricated the desired product by burning (welding) the lead to the required shape. NELCO subcontracted Vector Three Environmental Inc. of Brea, California, to clean the interior of all facilities and remove superficial lead from the topsoil. Remedial activities were monitored by Cardinal staff and confirmatory dust wipe and soil samples confirmed that remaining lead levels were very low. Environmental reports and sampling results were not available for review; therefore, lead levels prior to and after remediation and the depth of the soils removal are unknown.

Both current and future land use are evaluated in the selection of potential human receptors (EPA, 1991a). As described above, the site is currently used for industrial purposes and will likely remain industrial or commercial in the future given the site surroundings of commercial/industrial use. The site has never been used for residential purposes in the past, and its location next to a major arterial suggests that it would be undesirable for future residential development.

During an August 2006 groundwater sampling event, groundwater underlying the Site was measured at a depth of approximately 75 feet below ground surface. A clay unit exists starting at about 30 feet bgs, which likely represents a substantial barrier to upward migration of VOCs that volatilize at the capillary fringe of the water table. Currently, groundwater underlying the Site and in the immediate area is not used for domestic, industrial, or agricultural purposes. Future use of groundwater for potable purposes is also unlikely due to high concentrations of TDS. No evidence suggests that contamination extends to any potable aquifer that underlies the Gage unit.

3.3 Site Conceptual Exposure Model

The site conceptual exposure model is a description of potential exposure pathways associated with the site, including potential sources of contamination, transport mechanisms, exposure routes, and potentially exposed populations. An exposure

scenario consists of a potentially exposed population and one or more exposure pathways by which the receptor population may contact contaminants associated with a site. Only exposure pathways likely to be complete and to contribute significantly to overall exposure are evaluated quantitatively in the HHRA.

A complete exposure pathway consists of the following four elements:

- A source and mechanism of release of chemicals to the environment
- A transport medium for the released chemical
- An exposure point (the point of potential contact between receptor and medium)
- An exposure route (e.g., inhalation, ingestion)

If one or more of these elements are missing, the pathway is incomplete. Incomplete pathways are not quantitatively evaluated. Potentially complete pathways that are unlikely to contribute significantly to overall exposure are also not quantitatively evaluated. Therefore, an analysis of exposure pathways is included to identify those complete and significant exposure pathways that may be important for risk management decisions.

Sources of contamination, mechanisms of contaminant release from sources, and subsequent transport of contaminants through the environment are examined in this section to identify potentially contaminated media at the site. Potential exposure pathways for human receptors are discussed in subsequent sections.

The site conceptual exposure model (SCEM) for the site, illustrated in Figure 3-1, highlights pathways that are assumed potentially complete and significant. Chemical migration from soil to groundwater and subsequent exposure of people to chemicals in groundwater is not addressed.

Complete exposure pathways shown in the SCEM (Figure 3-1) are summarized in Table 3-1.

3.3.1 Potentially Exposed Populations

The overall scope of the analysis is graphically illustrated in the SCEM for soils at the Omega Site (Figure 3). The SCEM includes theoretically feasible exposures and provides a basis for discussing the likelihood and importance of potential exposure pathways at the site. As illustrated in the SCEM, potentially exposed populations are assumed to be an on-site industrial worker, an off-site industrial worker, and an on-site construction worker. Currently, no plans exist for residential development at the Site, and the Site location surrounded by commercial/industrial uses suggests that residential development in areas adjacent to the Site is unlikely.

3.3.1.1 Commercial/Industrial Workers

Potentially complete exposure pathways for commercial/industrial workers consist of incidental ingestion of surface soil following contact and subsequent hand-to-mouth activities[1], incidental ingestion of dust tracked from surface into buildings, inhalation of contaminants released from soil into air through wind or dust-generating activities (e.g., use of vehicles), and inhalation of volatiles in soil gas migrating into indoor air. Commercial/industrial workers could also be exposed through dermal contact with soil and interior dust and inhalation of soil gas accumulating indoors. Dermal exposure pathways are not expected to contribute significantly to overall exposure; however, this pathway is quantitatively evaluated. Incidental ingestion of surface soil and indoor dust are also evaluated.

If the site were redeveloped in the future, some subsurface soils may be brought to the surface during grading activities. However, typical construction in the area is slab-on-grade resulting in minimal disturbance of deeper soils. Evaluation of deeper subsurface soils was not deemed necessary for commercial/industrial workers.

3.3.1.2 Construction Workers

Potentially complete exposure pathways for commercial/industrial workers consist of incidental ingestion of surface soil following contact and subsequent hand-to-mouth activities, inhalation of fugitive dust through wind or dust-generating activities (e.g., use of vehicles, drilling, digging), and inhalation of contaminants released from soil gas into an excavation. Workers could also be exposed through dermal contact with soil and fugitive dust. Dermal exposure pathways are not expected to contribute significantly to overall exposure, however, this pathway is quantitatively evaluated.

Construction workers are also evaluated for exposure to subsurface soil. Subsurface soil at the site was sampled to evaluate the depth to which soils may have been contaminated. Workers are evaluated for incidental ingestion of subsurface soil.

3.3.2 Potential Exposure Pathways

As discussed above, an exposure pathway generally consists of a chemical source, mechanism for release and transport, a point of exposure to the contaminated medium, and a route of exposure into the receptor. The absence of any one of these elements would result in an incomplete exposure pathway. Further, if one of these steps is very inefficient, exposure potential may be negligible, even though the pathway is theoretically complete. Potential exposure pathways are therefore identified in the SCEM and evaluated to determine whether they are complete and significant. The SCEM (Figure 3) identifies those complete pathways that may represent significant potential for exposure and are therefore the focus of the HHRA. As described above, receptors of concern include commercial/industrial workers, construction workers, and recreational users.

---

[1] Under current conditions, much of the site is paved or otherwise covered by buildings or concrete. As such, this ingestion pathway is only applicable if the site is redeveloped in the future to remove buildings or pavement, thereby exposing commercial/industrial workers to bare soil.

3.3.2.1 Ingestion and Dermal Contact with Groundwater

Currently, groundwater within the contaminant area (Gage unit) is not used for domestic, industrial, or agricultural purposes. Future use of groundwater for potable purposes is also unlikely due to high concentrations of TDS. No evidence suggests that contamination extends to any potable aquifer that underlies the Gage unit. If future data collection indicates that downward vertical migration has occurred, then future risk evaluations will need to address a potential drinking water pathway. Currently, this groundwater exposure pathway for ingestion is incomplete for all potential receptors.

Groundwater is 70 feet below ground surface and construction workers will not encounter groundwater in their excavations. Currently, this groundwater exposure pathway for dermal contact is also incomplete.

3.3.2.2 Incidental Ingestion and Dermal Contact with Contaminated Surface Soil and Inhalation of Particulates Released from Surface Soil

Soils at the site contain elevated levels of some chemicals as a result of past practices and activities. Currently, surface soils at the site, for the most part, are not exposed because the site is mostly covered with asphalt pavement, buildings, or other structures. Direct contact with contaminants in surface soils is likely minimal. However, for the purposes of the HHRA, the site is assumed to be uncovered (unpaved) and direct exposure to COPCs in surface soil could occur.

If areas with contaminated surface soils are left uncovered following theoretical future redevelopment, future on-site commercial/industrial workers may contact surface soils. Potentially complete and significant pathways through which future on-site commercial/industrial workers may contact surface soils consist of incidental ingestion, dermal contact, and inhalation of particulates released from surface soils into ambient air.

Furthermore, if the pavement and buildings at the site are removed during construction, contaminated soils may be uncovered. Future on-site construction workers may incidentally ingest and dermally contact contaminants in surface soils and may inhale particulates released from surface soils. Although these exposures are unlikely to be significant given the duration of construction activities, they will be evaluated to provide the risk manager with additional information.

3.3.2.3 Incidental Ingestion of Subsurface Soils, Dermal Contact with Subsurface Soils, and Inhalation of Particulates Released from Subsurface Soils

If the site is redeveloped in the future, future on-site construction workers may contact contaminated subsurface soils. Construction workers may incidentally ingest and dermally contact contaminants in subsurface soils and may inhale particulates released from subsurface soils into ambient air. Future construction workers are

expected to be the only human populations with potential exposure to subsurface soils.

3.3.2.4 Inhalation of Contaminants in Indoor Air

Contaminants released from contaminated soil into soil gas above the 30-foot clay may migrate below buildings and migrate indoors through foundation cracks. People working or recreating indoors in these buildings may inhale contaminants in indoor air. Because dilution of air inside buildings occurs less rapidly than that in ambient air, some accumulation of contaminants is possible where high concentrations of VOCs are present in the subsurface below buildings. In addition, heating systems can, in theory, create a negative pressure that can enhance flow of soil gas into buildings. No such consistent pressure gradient will exist to promote flow of soil gas to outdoor ambient air. The indoor air pathway is theoretically complete for current and future commercial/industrial workers. In order to complete the evaluation of vapor intrusion, soil data are used qualitatively to assess the potential for impacts to indoor air. Quantitative risk estimates are based on measured VOC concentrations in air in buildings onsite and adjacent to the site.

VOCs in groundwater could also volatilize to soil gas and migrate to indoor air. However, these vapors would exist below the 30 foot clay unit and vertical migration would probably be minimal. Also, any VOCs originating from groundwater would be reflected in shallow soil gas samples collected at the site, and any VOCs intruding into buildings would be reflected in indoor air samples collected within these buildings.

3.3.2.5 Inhalation of Indoor Air – Volatilization during Groundwater Use

As noted above, groundwater underlying the Site and in the immediate vicinity is currently not used for any purpose nor is it likely to be used for potable use in the future due to high concentrations of TDS. As such, this groundwater exposure pathway is incomplete.

3.3.2.6 Inhalation of Ambient Air

Volatile COPCs in the subsurface could migrate to the surface and be released to ambient air. Construction workers and on-site industrial workers who are outdoors could inhale these chemicals. Release of vapors does not require excavation or exposure of contaminated soils to air. Vapors may migrate through the vadose zone to the surface and be released as a consequence of barometric pumping and diffusion. Such exposures, however, will be greatly reduced by barriers to vapor migration such as buildings or pavement that currently cover portions of the site, or could be placed on the site if redeveloped. Furthermore, because the atmosphere outside has no boundaries, any vapors that rise to surface and are released to ambient air will be quickly dispersed and concentrations would be low. Vapors migrating to indoor air are likely to present a more important exposure pathway for commercial/industrial workers because they will spend large amounts of time indoors, and because the building and foundation represent a "trap" for migrating gases. Conclusions

developed for indoor exposure to vapors should be protective of ambient exposure to vapors. Exposure to vapors of COPCs released to ambient air were not further evaluated.

3.4 Exposure Parameter Assumptions

Exposure assumptions for the receptors and exposure pathways of concern are discussed below and presented in Table 3-2. A number of exposure assumptions apply to most or all exposure pathways and are discussed separately. The following sections provide pathway-specific and general exposure assumptions developed from site-specific and EPA default exposure information.

3.4.1 General Exposure Assumptions

3.4.1.1 Body Weight

In accordance with U.S. EPA guidance (1989), the value for body weight is the average weight of the receptor over the exposure period. For estimating exposures for commercial/industrial workers and construction workers, a body weight of 70 kg is used as recommended by U.S. EPA (1989, 1991) and Cal EPA (1992, 2005d).

3.4.1.2 Body Surface Area

For commercial/industrial and construction workers, a total body surface area that is dermally exposed is assumed to be 3,300 cm^2/event (EPA, 2001; CalEPA, 2005d;). This surface area basically assumes that arms, hands and head will all be exposed at each event. Cooler weather or work that does not involve excavation, grading or other soil moving activities would likely result in lesser exposure. The dermal adherence factor or contact rate is assumed to be 0.37 mg/cm^2 for the construction worker. This factor is the sum of the geometric mean of post-activity soil loadings onto hands, arms, and face of a construction worker (EPA, 1997). The dermal adherence factor or contact rate for commercial/industrial workers is assumed to be 0.2 mg/cm^2 (CalEPA, 2005). These rates are estimates of soil adherence to skin and varies based on moisture content, part of the body, and type of activity.

3.4.1.3 Averaging Time

Averaging time is the period in days over which intake is averaged. For noncarcinogenic chemicals, intakes are averaged over the exposure duration (exposure duration [years] * 365 days/year). For carcinogens, intake calculations average the total cumulative dose over a lifetime (70 years * 365 days/year). Averaging times differ for carcinogens and noncarcinogens because the effects of carcinogenic chemicals are assumed to have no threshold. Therefore, any exposure to a carcinogen carries a finite risk of cancer during the individual's lifetime. Within reason, this means that a single large exposure to a carcinogen is expected to carry the same risk as the same dose divided into many small exposures. Therefore, carcinogen intakes are expressed in terms of lifetime exposures, regardless of the actual exposure duration (EPA, 1989).

3.4.1.4 Exposure Frequency

The exposure frequency is the number of days per year that an individual participates in a particular activity. For the commercial/industrial worker scenario, the exposure frequency is 250 days per year (EPA, 1989; CalEPA 2005d). Construction workers would not work in an excavation or with exposed soils for the entire duration of construction; therefore, the exposure frequency for construction workers was assumed to be 60 days per year. This frequency is the equivalent to about 12 weeks or 3 months of construction time spent entirely within an excavation.

3.4.1.5 Exposure Duration

Exposure duration is the number of years over which exposure may occur. For the commercial/industrial worker, an exposure duration of 25 years is used (EPA, 1997; CalEPA, 2005d). For construction workers, an exposure duration of 1 year was assumed. This duration is a typical construction period for a building or home.

3.4.1.6 Exposure Time

Exposure time is the number of hours per day spent at the site. For the commercial/industrial worker, an exposure time of 8 hours is used to represent the typical workday. For the construction worker, an exposure time of 10 hours is used to represent the typical workday.

3.4.2 Pathway-Specific Exposure Assumptions

Several exposure parameters apply to specific exposure pathways and are described below.

3.4.2.1 Soil and Interior Dust Ingestion

A soil ingestion rate of 100 mg per day is used for the RME commercial/industrial worker scenario (CalEPA, 2005d). A CTE ingestion rate of 50 mg per day is used for the commercial/industrial worker to address some potential variability in this factor.

There is no standard ingestion rate for construction workers. To address the potential variability in this factor, RME and CTE scenarios were developed. CTE and the RME soil ingestion rates of 100 and 480 mg per day, respectively, are used for the construction worker (EPA 1997). The CTE ingestion rate of 100 mg per day is equivalent to the common default value used by both DTSC and EPA for an adult. The RME ingestion rate of 480 mg per day is equivalent to the soil ingestion of an adult working outdoors in the summer.

3.4.2.2 Inhalation of Fugitive Dust

The inhalation rate used for adult commercial/industrial workers under the CTE scenario is 20 m^3 per day, which is equivalent to 0.83 m^3 per hour (CalEPA, 2005d). To address some potential variability in this factor, an inhalation rate of 28.8 m^3 per day, which is equivalent to 1.2 m^3 per hour is used for the commercial/industrial workers under the RME scenario.

No standard inhalation rates are available for construction workers. To address the potential variability in this factor, RME and CTE scenarios were developed. The CTE and RME inhalation rates used for adult construction workers are 2.5 and 4.8 m^3 per hour, respectively (EPA, 1997). This 2.5 m^3 per hour estimate is based on the inhalation rate of an adult male involved in moderate activities, such as major indoor repairs and alterations and climbing stairs. The 4.8 m^3 per hour estimate is based on the inhalation rate of an adult male involved in heavy activities, such as vigorous physical exercise and climbing stairs while carrying a load. Activities listed are only examples of the level of effort for different inhalation rates. Outdoor construction workers would be engaged in other tasks, but the level of effort implied is still appropriate. Since it is unlikely that a construction worker will be engaged in these levels of activities for their entire 10-hour workday for every workday of the year, use of these inhalation estimates is assumed to be conservative.

3.4.2.3 Inhalation of Indoor Air

Inhalation of indoor air was evaluated using measured indoor air concentrations to directly estimate risk related to indoor air exposure. The single exception was the evaluation of the parcel to the south of the site where the former Skateland facility existed. This building will soon be demolished and indoor air data for the building are no longer relevant. For this parcel, risk estimates were based on measured concentrations of VOCs in soil gas. The USEPA advanced soil gas spreadsheet implementation of (Windows™ - Excel) the Johnson and Ettinger vapor intrusion model (SG_ADV_Feb04.xls last modified February, 2004) was used to estimate potential indoor air concentrations from soil gas concentrations by calculating flux of chemicals through a foundation, taking into account building size and ventilation. The following site-specific criteria were entered into the model:

- Soil gas data from only the shallow depths sampled (0 to 6 feet bgs) were used because soil gas from the shallow portion of the vadose zone would be the most likely to migrate into onsite buildings. For the model soil gas sample depth was assumed to be 5 feet bgs.

- An average soil temperature of 67°F (19.4°C) was assumed per Figure A-1 in DTSC Indoor Air Guidance (Feb. 2005)

- Site soil was assumed to be clay, consistent with data from soil borings.

- The model was adjusted to account for an exposure time of 8 hours per day, which is typical for a commercial worker. Similarly, the exposure frequency and duration were modified to 250 days per year and 25 years, respectively, to represent a typical commercial worker.

- Toxicity criteria were updated using the online Office of Environmental Health Hazard Assessment (OEHHA) Toxicity Criteria Database[2] (first priority) and the online USEPA Integrated Risk Information System (IRIS)[3] database.

- The exchange rate was changed to a value of 1.0 air exchanges per hour. This value is consistent with the minimal ventilation requirements per the 2001 Energy Efficiency Standards for Nonresidential Buildings.[4] This ventilation rate is appropriate for a commercial/industrial facility.

Other model input parameters include the physical/chemical properties of COPCs. Chemical properties (such as air and water diffusivities and Henry's law constants) were either found in the model, researched for inclusion in the model or calculated using the references provided in the user's guide for the Johnson and Ettinger Model (EPA, 1997). Model defaults were used when site specific values were not available.

3.4.2.4 Exposure to Lead

Risks for lead were evaluated using EPA's Adult Lead Methodology for occupational exposures and comparing to the threshold level of no more than 5 percent probability of blood lead levels exceeding 10 µg/dL. The EPA Adult Lead Methodology was used instead of the DTSC Leadspread model because EPA Adult Lead Methodology includes a calculation for blood lead levels for an adult worker fetus. In addition, the DTSC indicated in recent discussions that the Leadspread model was currently being revised and that they were not recommending its use.

Some key assumptions made in the EPA Adult Lead Methodology include:

- Exposure duration was revised to reflect 250 days per year, typical duration for a commercial/industrial worker.

- Exposure concentration for lead in soil was assumed to be 44.4 mg/kg (95% UCL for lead as shown in Table 3.1 for surface soil).

Default values were used for the remaining model parameters.

Lead calculations are presented in Appendix A. Risks from lead exposure are not calculated for the construction worker. A relatively constant lead intake over a minimum of 90 days, possibly more, is necessary to achieve a new quasi-steady state blood lead concentration and the exposure duration of the construction worker was

[2] http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
[3] http://www.epa.gov/iris/subst/index.html
[4] California Energy Commission 2001. Manual for Compliance with the 2001 Energy Efficiency Standards for Nonresidential Buildings, High-rise Residential Buildings, and Hotels/Motels). Document No P400-01-032. August.

estimated to be only 60 days. The Adult Lead Methodology is not capable of resolving such temporal effects.

3.5 Exposure Point Concentrations

Exposure point concentrations are estimated chemical concentrations a receptor will contact over an exposure period. Because of the uncertainty associated with any estimate of exposure, 95 percent upper confidence levels (UCLs) of the arithmetic mean are generally used as exposure point concentrations. Exposure point concentrations are calculated appropriately as 95 percent UCL of the arithmetic mean only when associated with an exposure unit within which exposures can reasonably be assumed to occur randomly. Exposure point concentrations are estimated using this approach for all COPCs for each exposure media identified for the site. EPA's statistical program *ProUCL*(EPA, 2001), were used to test data distributions and to compute UCLs of population means. For these calculations, non-detects were assumed to be equivalent to half of the detection limit. For datasets with less than 5 samples, the number of samples was too few to calculate a UCL and the maximum detected concentration was used as the exposure point concentration. Exposure point concentrations for all datasets assessed quantitatively are summarized in Tables 3-3 through 3-11.

3.6 Chemical Intake

The amount of chemical that is taken into a person's body following exposure is referred to as chemical intake. Intake is expressed in units of milligrams of chemical per kilogram of body weight per day (mg/kg-day), and is referred to as chronic daily intake (CDI). CDI depends on the concentration of chemicals in media at the point of human contact (exposure point concentration), and exposure assumptions specific to the receptor population, including frequency and duration of exposure, body weight, and contact rate. EPA guidance indicates that exposure assumptions should be chosen so that their combination results in an estimate of the reasonable maximum exposure (RME) for the exposure pathway. RME is the highest exposure that is within the range of possible exposures at the site (EPA, 1989). RME is designed to be conservative yet designed to prevent unrealistic, or "worst case" estimates from serving as the basis of risk management decisions. A range of exposure estimates is provided by estimating the central tendency exposure (CTE) for each exposure pathway. CTE uses exposure assumptions that predict an average exposure to an individual. Presentation of both the RME and CTE risks for the site provides the risk manager with a range of potential risks.

CDI are calculated using exposure point concentrations for the media of concern and the exposure assumptions described in Section 3. CDIs are estimated for each selected exposure pathway. The equations used to calculate CDIs for each exposure pathway are shown below.

3.6.1 Ingestion of Soils and Interior Dust

To determine CDIs associated with incidental ingestion of chemicals in solid media (e.g., surface soils and interior dust), the following equation is used (EPA, 1989).

$$CDI\ (mg/kgday) = \frac{CS\ x\ IR\ x\ CF\ x\ FI\ x\ EF\ x\ ED\ x\ BAF}{BW\ x\ AT}$$

Where:

CDI = Chronic Daily Intake ((mg/kg)/day)

CS = Chemical Concentration in Soil or Dust (mg/kg)

IR = Ingestion Rate (mg/day)

CF = Conversion Factor (10^{-6} kg/mg)

FI = Fraction Ingested from Contaminated Source (unitless)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

BAF = Bioavailability Factor for COPC in Soil or Dust (unitless)

BW = Body Weight (kg)

AT = Averaging Time (days)

3.6.2 Dermal Contact with Soils and Interior Dust

To determine CDIs associated with dermal contact with chemicals in solid media (e.g., surface soils and interior dust), the following equation is used (EPA, 1989).

$$CDI\ (mg/kgday) = \frac{CS\ x\ SA\ x\ AF\ x\ ABS\ x\ CF\ x\ EF\ x\ ED}{BW\ x\ AT}$$

Where:

CDI = Chronic Daily Intake ((mg/kg)/day)

CS = Chemical Concentration in Soil or Dust (mg/kg)

SA = Skin surface area exposed (cm^2)

AF = Soil to skin adherence factor (mg/cm^2)

ABS = Absorption fraction of chemical from soil

CF = Conversion Factor (10^{-6} kg/mg)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

BW = Body Weight (kg)

AT = Averaging Time (days)

3.6.3 Inhalation of Fugitive Dust

To determine CDIs associated with inhalation of COPCs in fugitive dust, the following equation is used (EPA, 1989).

$$CDI\ (mg/kgday) = \frac{CA\ x\ IhR\ x\ ET\ x\ EF\ x\ ED}{BW\ x\ AT}$$

Where:

CDI = Chronic Daily Intake ((mg/kg)/day)

CA = Chemical Concentration in Air (mg/m^3)

ET = Exposure Time (hours/day)

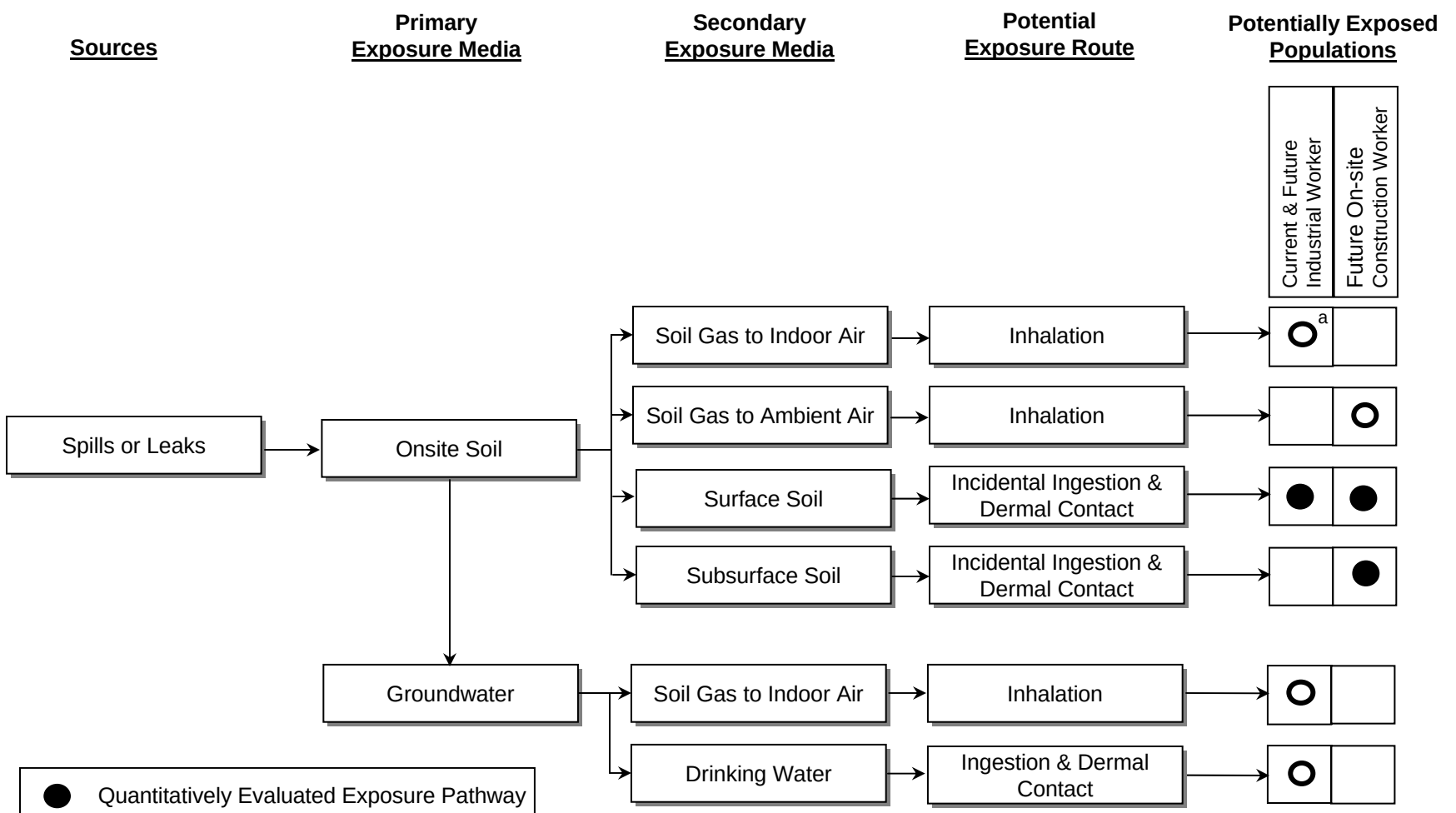
IhR = Inhalation Rate (m^3/hour)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

BW = Body Weight (kg)

AT = Averaging Time (days)



a – Indoor air is quantitatively evaluated using measured indoor air concentrations for all parcels except for the former Skateland Facility. Since this building will soon be demolished and its indoor air data are no longer relevant, the indoor air pathway for this parcel is evaluated using measured soil gas data.

CDM

Figure 3-1
Site Conceptual Exposure Model – Omega Chemical Site
Whittier, California

Table 3-1
Summary of Receptors and Pathways of Concern

Exposure Pathway	Receptors of Concern		
	Current and Future Industrial/ Commercial Workers	**Current and Future Construction Workers**	**Current and Future Recreational Users**
Indoor Air	Inhalation		Inhalation
Ambient Air		Inhalation[1]	
Surface Soil	Ingestion and Dermal Contact	Ingestion and Dermal Contact	
Subsurface Soil[b]		Ingestion and Dermal Contact	

[a] [a] Exposure to fugitive dust.
[b] Subsurface soils were defined as soils from 18" to 30' bgs.

Table 3-2
Exposure Parameters

Exposure Parameter	Current and Future Industrial/Commercial Workers	Future Construction Worker
Body Weight (kg)	70 [a,d]	70 [a,d]
Averaging Time - Carcinogenic (days)	25,550 [a,d]	25,550 [a,d]
Averaging Time - Noncarcinogenic (days)	9,125 [a,d]	365 [a]
Exposure Frequency (days/yr)	250 [d]	60 [b]
Exposure Duration (years)	25 [d]	1 [b]
Exposure Time (hrs/day)	8	10
Ingestion Rate (mg/day)	RME = 100 CTE = 50 [b, d]	RME = 480 CTE = 100 [b,c]
Inhalation Rate (m^3/hr)	RME = 1.2 CTE = 0.83 [b, d]	RME = 4.8 CTE = 2.5 [b,c]
Skin Surface Area Available for Contact (cm^2/event)	3,300 [d]	3,300 [d]
Contact Rate (mg/cm^2)	0.2 [d]	0.37 [c]

RME – reasonable maximum exposure
CTE – central tendency exposure
NA – not applicable
Sources: a – USEPA, 1989a. Risk Assessment Guidance for Superfund. Volume I - Human Health Evaluation Manual, Part A. EPA/540/1-89/002. Office of Emergency and Remedial Response. Washington D.C.
b – Site-specific. Professional judgment. See text.
c – USEPA, 1997. Exposure Factors Handbook. EPA/600/P-95/002Fa
d – CalEPA, 2005, Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil. Appendix C. January revision.

Table 3-3
Summary of Exposure Point Concentrations for Surface Soil (0 to 1.5 ft bgs)

Chemical	Mean mg/kg	Maximum mg/kg	95 UCL mg/kg	95-UCL Statistic	Exposure Point Concentration mg/kg	Exposure Point Concentration Statistic
2-METHYLNAPHTHALENE	0.72	0.48	3.32	UCL-NP	0.48	Max
BIS(2-ETHYLHEXYL)PHTHALATE	4.51	51	19	95% UCL-T	19.43	95% UCL-T
CHROMIUM	38.12	308.57143	99	UCL-NP	98.88	UCL-NP
CHROMIUM VI	6.35	51.428571	16.48	UCL-NP	16.48	UCL-NP
DIELDRIN	0.01	0.05	0.02	UCL-NP	0.02	UCL-NP
IRON	22,650.00	23200	NO UCL	UCL-NP	23,200	Max
LEAD	32.15	100	44.40	95% UCL-G	44.40	95% UCL-G
NAPHTHALENE	0.75	1.2	3.36	UCL-NP	1.20	Max
PCB-1254 (AROCLOR 1254)	0.0302	0.5	0.25	UCL-NP	0.25	UCL-NP
PHENANTHRENE	0.7492	0.03	3.61	UCL-NP	0.03	Max

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
(4) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
mg/kg = milligram per kilogram

Table 3-4
Summary of Exposure Point Concentrations for Surface and Subsurface Soil (0 to 30 ft bgs)

Chemical	Mean mg/kg	Maximum mg/kg	95 UCL mg/kg	95-UCL Statistic	Exposure Point Concentration mg/kg	Exposure Point Concentration Statistic
1,1,1-TRICHLOROETHANE	33.59	1200	264	UCL-NP	264	UCL-NP
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	16.81	590	125	UCL-NP	125	UCL-NP
1,1-DICHLOROETHENE	2.09	60	12.63	UCL-NP	12.63	UCL-NP
1,2-DICHLOROETHANE	1.60	1.6	8.44	UCL-NP	1.60	Max
1,4-DIOXANE	2.69	41	15.95	UCL-NP	15.95	UCL-NP
2-METHYLNAPHTHALENE	0.45	0.54	1.84	UCL-NP	0.54	Max
BENZO(A)ANTHRACENE	0.51	2.4	2.08	UCL-NP	2.08	UCL-NP
BENZO(A)PYRENE	0.49	1.6	2.01	UCL-NP	1.60	Max
BENZO(B)FLUORANTHENE	0.47	0.91	1.97	UCL-NP	0.91	Max
BIS(2-ETHYLHEXYL)PHTHALATE	2.72	51	15.32	UCL-NP	15.32	UCL-NP
CHROMIUM	36.9	360	77.2	UCL-NP	77.22	UCL-NP
CHROMIUM VI	5.3	51.4	11.0	UCL-NP	11.03	UCL-NP
DIELDRIN	0.007	0.05	0.035	UCL-NP	0.04	UCL-NP
IRON	22,925	23200	23,579	95% UCL-N	23200	Max
LEAD	48	890	54	95% UCL-T	53.69	95% UCL-T
METHYLENE CHLORIDE	3.26	100	21.30	UCL-NP	21.30	UCL-NP
NAPHTHALENE	0.34	1.2	0.99	UCL-NP	0.99	UCL-NP
PCB-1254 (AROCLOR 1254)	0.03	0.5	0.08	UCL-NP	0.08	UCL-NP
PHENANTHRENE	0.56	5	2.39	UCL-NP	2.39	UCL-NP
TETRACHLOROETHENE	51.61	1300	317.45	UCL-NP	317	UCL-NP
TOLUENE	2.13	62	13.10	UCL-NP	13.10	UCL-NP
TRICHLOROETHENE	4.40	140	30.18	UCL-NP	30.18	UCL-NP
TRICHLOROFLUOROMETHANE (FREON 11)	6.55	220	47.33	UCL-NP	47.33	UCL-NP

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detecte
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
(4) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
mg/kg = milligram per kilogram

Table 3-5
Summary of Exposure Point Concentrations for Soil Gas (0 to 6 ft bgs) - South Parcel - Skateland

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	80,204	330,000	1,014,061	95% UCL-G assumed	330000	Max
1,1-DICHLOROETHENE	46,487	210,000	562,808	95% UCL-G	210000	Max
1,2,4-TRIMETHYLBENZENE	194	3	2,284	95% UCL-G	3.0	Max
2,2,4-TRIMETHYLPENTANE	72	12	726	95% UCL-G assumed	12	Max
2-BUTANONE	68	3	1,069	95% UCL-G	2.6	Max
4-ETHYLTOLUENE	68	2	1,073	95% UCL-G	2.4	Max
ACETONE	306	78	1,286	95% UCL-G	78	Max
CARBON DISULFIDE	69	4	1,050	95% UCL-G	3.6	Max
CHLOROFORM	194	3	2,303	95% UCL-G	2.5	Max
DICHLORODIFLUOROMETHANE	415	1,900	5,338	95% UCL-G	1900	Max
HEXANE (N-HEXANE)	69	3	1,027	95% UCL-G	3.0	Max
TETRACHLOROETHENE	3,250	13,000	11,592	95% UCL-G	11592	95% UCL-G
TRICHLOROETHENE	2,538	7,800	18,355	95% UCL-G	7800	Max
TRICHLOROFLUOROMETHANE (FREON 11)	22,773	94,000	252,608	95% UCL-G	94000	Max

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detecte
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
(4) Exposure point concentrations for soil gas were entered into the Johnson and Ettinger model to determine indoor air exposure point concentrations.
UCL = Upper Confidence Level
ppbv = parts per billion volume

Table 3-6
Summary of Exposure Point Concentrations for Indoor Air - Site Parcel

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.34	3.90	2.16	95% UCL-N	2.16	95% UCL-N
1,1-DICHLOROETHENE	1.74	4	2.84	95% UCL-N	2.84	95% UCL-N
ACETONE	673	2,500	4,540	95% UCL-G	2500	Max
BENZENE	1.92	4	3.05	95% UCL-G	3.05	95% UCL-G
CARBON TETRACHLORIDE	0.33	0.11	2.31	UCL-NP	0.11	Max
CHLOROFORM	0.29	0.05	1.32	95% UCL-T	0.05	Max
DICHLORODIFLUOROMETHANE	0.61	0.62	1.00	95% UCL-T	0.62	Max
ETHYLBENZENE	2.78	11.00	5.94	95% UCL-G	5.94	95% UCL-G
METHYLENE CHLORIDE	13.94	74.00	77.72	95% UCL-G	74.0	Max
TETRACHLOROETHENE	2	5	3	95% UCL-N	2.71	95% UCL-N
TOLUENE	105	620	525	95% UCL-G assumed	525	95% UCL-G assumed
TRICHLOROETHENE	0.63	1.20	0.99	95% UCL-N	0.99	95% UCL-N
TRICHLOROFLUOROMETHANE (FREON 11)	1.12	2.40	1.64	95% UCL-N	1.64	95% UCL-N

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
ppbv = parts per billion volume

Table 3-7
Summary of Exposure Point Concentrations for Indoor Air - North Parcel

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.31	5.10	5.26	95% UCL-N	5.10	Max
1,1-DICHLOROETHENE	1.26	3	2.17	95% UCL-N	2.17	95% UCL-G
1,4-DICHLOROBENZENE	0.07	0.15	0.13	95% UCL-N	0.13	UCL-NP
ACETONE	365.02	1,400	6,982.00	95% UCL-G	1400	Max
BENZENE	0.31	0.33	0.33	95% UCL-N	0.33	Max
CARBON TETRACHLORIDE	0.14	0.13	0.17	95% UCL-N	0.13	Max
CHLOROFORM	0.07	0.07	0.10	95% UCL-N	0.07	Max
DICHLORODIFLUOROMETHANE	0.46	0.66	0.61	95% UCL-N	0.61	UCL-NP
ETHYLBENZENE	0.17	0.19	0.19	95% UCL-N	0.19	Max
METHYLENE CHLORIDE	1	1	1	95% UCL-N	1.36	UCL-NP
TETRACHLOROETHENE	1.12	3.30	4.16	95% UCL-G	3.30	Max
TRICHLOROETHENE	0.80	2.50	2.92	95% UCL-G assumed	2.50	Max
TRICHLOROFLUOROMETHANE (FREON 11)	1.29	2.10	1.95	95% UCL-N	1.95	95% UCL-T

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
ppbv = parts per billion volume

Table 3-8
Summary of Exposure Point Concentrations for Indoor Air - West Parcel

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.88	3.40	No UCL	Too Few Samples for UCL	3.4	Max
1,1-DICHLOROETHENE	3.10	6	No UCL	Too Few Samples for UCL	5.7	Max
1,4-DICHLOROBENZENE	0.03	0.05	No UCL	Too Few Samples for UCL	0.045	Max
ACETONE	11.05	18	No UCL	Too Few Samples for UCL	18	Max
BENZENE	0.31	0.45	No UCL	Too Few Samples for UCL	0.45	Max
CARBON TETRACHLORIDE	0.07	0.11	No UCL	Too Few Samples for UCL	0.11	Max
CHLOROFORM	0.03	0.05	No UCL	Too Few Samples for UCL	0.048	Max
DICHLORODIFLUOROMETHANE	0.38	0.58	No UCL	Too Few Samples for UCL	0.58	Max
ETHYLBENZENE	0.23	0.36	No UCL	Too Few Samples for UCL	0.36	Max
METHYLENE CHLORIDE	0.29	0	No UCL	Too Few Samples for UCL	0.43	Max
TETRACHLOROETHENE	8.68	15.00	No UCL	Too Few Samples for UCL	15	Max
TRICHLOROETHENE	0.46	0.80	No UCL	Too Few Samples for UCL	0.8	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.75	1.20	No UCL	Too Few Samples for UCL	1.2	Max

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
ppbv = parts per billion volume

Table 3-9
Summary of Exposure Point Concentrations for Indoor Air - South Parcel - Bishop

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.75	1.3	No UCL	Too Few Samples for UCL	1.3	Max
1,1-DICHLOROETHENE	1.95	3.6	No UCL	Too Few Samples for UCL	3.6	Max
1,4-DICHLOROBENZENE	0.04	0.053	No UCL	Too Few Samples for UCL	0.053	Max
ACETONE	14.12	17.35	No UCL	Too Few Samples for UCL	17.35	Max
BENZENE	0.38	0.39	No UCL	Too Few Samples for UCL	0.39	Max
CARBON TETRACHLORIDE	0.09	0.091	No UCL	Too Few Samples for UCL	0.091	Max
CHLOROFORM	0.03	0.036	No UCL	Too Few Samples for UCL	0.036	Max
DICHLORODIFLUOROMETHANE	0.58	0.605	No UCL	Too Few Samples for UCL	0.605	Max
ETHYLBENZENE	0.28	0.4	No UCL	Too Few Samples for UCL	0.4	Max
METHYLENE CHLORIDE	0	0.49	No UCL	Too Few Samples for UCL	0.49	Max
TETRACHLOROETHENE	2.27	4.3	No UCL	Too Few Samples for UCL	4.3	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.49	0.65	No UCL	Too Few Samples for UCL	0.65	Max

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
ppbv = parts per billion volume

Table 3-10
Summary of Exposure Point Concentrations for Indoor Air - South Parcel - LA Carts/Oncology Care

Chemical	Mean ppbv	Maximum ppbv	95 UCL ppbv	95-UCL Statistic	Exposure Point Concentration ppbv	Exposure Point Concentration Statistic
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.69	1.90	1.45	95% UCL-N	1.9	95% UCL-N
1,1-DICHLOROETHENE	0.33	0.92	0.73	95% UCL-N	0.92	95% UCL-N
1,2-DICHLOROETHANE	0.048	0.080	0.077	95% UCL-N	0.08	95% UCL-N
1,4-DICHLOROBENZENE	0.048	0.065	0.070	95% UCL-N	0.065	Max
ACETONE	161	490	677	95% UCL-G	490	Max
BENZENE	0.47	0.68	0.60	95% UCL-N	0.68	95% UCL-N
CARBON TETRACHLORIDE	0.081	0.083	0.082	95% UCL-N	0.083	95% UCL-N
CHLOROFORM	0.089	0.14	0.13	95% UCL-N	0.14	95% UCL-N
DICHLORODIFLUOROMETHANE	0.61	0.68	0.67	95% UCL-N	0.68	95% UCL-N
ETHYLBENZENE	0.28	0.47	0.42	95% UCL-G assumed	0.47	95% UCL-G assumed
METHYLENE CHLORIDE	0.93	1.70	1.55	95% UCL-N	1.7	95% UCL-N
TETRACHLOROETHENE	0.091	0.24	0.25	95% UCL-G	0.24	Max
TOLUENE	43.28	150	286	95% UCL-G	150	Max
TRICHLOROFLUOROMETHANE (FREON 11)	0.40	0.57	0.53	95% UCL-N	0.57	95% UCL-N

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.
(2) The maximum listed here is the maximum value in the dataset used for the calculation of UCLs. This dataset includes half the detection limit for the non-detects. As a result, in some cases these maximum values are above the maximum detected.
(3) Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric UCL (UCL-NP); 95% UCL assuming Gamma distribution (95% UCL-G).
UCL = Upper Confidence Level
ppbv = parts per billion volume

Section 4
Toxicity Assessment

The purpose of a toxicity assessment is to review and summarize available information on the potential for each chemical of potential concern (COPC) to cause adverse effects in exposed individuals. Adverse effects include both noncarcinogenic and carcinogenic health effects in humans. For most adverse effects caused by chemicals, a positive relationship exists between dose (intake of a chemical through a particular exposure pathway, such as ingestion) and response. Generally, as dose increases, type and severity of adverse response also increases. Further, time of onset of toxic responses often shortens.

A key facet of any toxicity assessment is the use of dose-response information to describe a quantitative relationship between human exposure and potential for adverse health effects. Quantitative toxicity criteria are generally numerical expressions developed by EPA of the relationship between chronic average daily dose (exposure) and toxic response (adverse health effects). As described below, separate toxicity criteria are developed for assessment of carcinogenic and noncarcinogenic health effects.

Sources of toxicity information included, in order of descending priority, are:

- Office of Environmental Health Hazard Assessment (CalEPA) Toxicity Criteria Database
- USEPA's Integrated Risk Information System (IRIS)
- USEPA criteria documents
- Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles

This section explains how toxicity criteria for carcinogens and noncarcinogens are developed and expressed, and summarizes toxicity values for each COPC. The general basis for the development of toxicity values for carcinogens and noncarcinogens is presented in subsections 4.1 and 4.2, respectively, along with a summary of the toxicity values for all COPCs.

4.1 Carcinogens

4.1.1 Evidence of Carcinogenicity

USEPA has developed a classification system for carcinogens, which characterizes the overall weight of evidence of carcinogenicity based on the availability of human, animal, and other supportive data. Three major factors are considered:

- The quality of evidence from human studies
- The quality of evidence from animal studies

- Other supportive data assessed to determine whether the overall weight of evidence should be modified

USEPA classification system for the characterization of the overall weight of carcinogenicity has the following five categories:

1. Human Carcinogen. This category indicates that there is sufficient evidence from epidemiological studies to support a causal association between an agent and cancer.

2. Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

3. Possible Human Carcinogen. This category indicates that there is limited evidence of carcinogenicity in animals in the absence of adequate data on humans.

4. Not Classified. This category indicates that the evidence for carcinogenicity in animals is inadequate.

5. Evidence of Noncarcinogenicity to Humans. This category indicates that there is evidence for noncarcinogenicity in at least two adequate animal tests in different species or in both epidemiological and animal studies.

4.1.2 Cancer Slope Factors

Carcinogenic toxicity criteria are usually provided as cancer slope factors (CSFs) in units of excess risk per milligram of chemical per kilogram of body weight per day ($(mg/kg\text{-}day)^{-1}$). These factors are based on the assumption that no threshold exists for carcinogenic effects and any dose is associated with some finite carcinogenic risk. Chemical-specific toxicity criteria for some of the carcinogens at the site are presented in Table 4-1.

USEPA has used a variety of specialized models to estimate the upper bound risk of carcinogenesis for a number of compounds. Data from animal or epidemiological studies are used to determine slope factors, which are expressed as $(mg/kg\text{-}day)^{-1}$ for a lifetime exposure. The CSF describes the increase in an individual's risk of developing cancer over a 70-year lifetime per unit of exposure where the unit of exposure is expressed as mg/kg-day.

CSFs are calculated using methods protective of human health and are based on the assumption that cancer risks decrease linearly with decreasing dose. The 95 percent upper confidence limit estimate for the slope is used in most cases to compensate for animal to human extrapolation and other uncertainties. The resulting CSFs are considered to be upper range estimates that are unlikely to underestimate carcinogenic potential in humans.

When the upper-bound CSF is multiplied by the lifetime average daily dose of a potential carcinogen, the product is the upper-bound lifetime individual cancer risk associated with exposure at that dose. The calculated risk is thus an estimate of the increased likelihood of cancer resulting from exposure to a chemical. For example, if the product of the CSF and the average daily dose is 1×10^{-6}, the predicted upper-bound cancer risk for the exposed population is one in one million, or 0.0001 percent. This risk is in addition to any "background" risk of cancer not related to the chemical exposure.

Calculation of risk often relies on data derived from chronic animal bioassays. The likelihood that an animal carcinogen is also a human carcinogen is a function of the following factors:

- The number of tissues affected by the chemical
- The number of animal species, strains, sexes, and number of experiments and doses showing a carcinogenic response
- The occurrence of clear-cut dose-response relationships as well as a high level of statistical significance of the increased tumor incidence in treated compared to control groups
- A dose-related decrease in time-to-tumor occurrence or time-to-death with tumor
- A dose-related increase in the proportion of malignant tumors

Animal studies are usually conducted using relatively high doses to observe adverse effects. Because humans are expected to be exposed at lower doses, data are adjusted using a mathematical model. Data from animal studies are fitted to a linearized multi-stage model and a dose-response curve is obtained. The low-dose slope of the dose-response curve is subjected to various adjustments (e.g., calculation of 95 percent UCL), and inter-species scaling factors are often applied to derive slope factors for humans. Dose-response data derived from human epidemiological studies are fitted to dose-time-response curves on an individual basis. These models provide conservative but plausible estimates of upper limits on lifetime risk. Although the actual risk is unlikely to be higher than the estimated risk, it could be considerably lower. In some instances, it may even be zero.

4.2 Noncarcinogens

Toxicity criteria for noncarcinogens, or for significant noncarcinogenic effects caused by carcinogens, are provided as reference doses (RfD) for oral and inhalation exposure and are expressed in units of milligram of chemical per kilogram of body weight per day (mg/kg-day). RfDs may be interpreted as thresholds below which adverse effects are not expected to occur in the most sensitive populations even if the exposure occurs continuously over a lifetime. Chemical-specific toxicity criteria for some of the noncarcinogens at the site are presented in Table 4-2.

RfDs are usually derived from no observable adverse effect levels (NOAELs) taken either from human studies, often involving workplace exposures, or from animal studies, and are adjusted downward using uncertainty or modifying factors. For example, a modifying factor of 2 to 10 may be applied if the database on a particular chemical lacks information on possible reproductive or developmental toxicity.

Uncertainty factors are generally applied to adjust for the possibility that humans are more sensitive than experimental animals and that there may be sensitive subpopulations of humans (e.g., children, pregnant women, individuals with hay fever or asthma). Depending upon the information available, other factors may also be applied.

RfDs are presented in units of mg/kg-day for comparison with estimated chronic daily intake into the body. Chronic exposure in this instance is not clearly defined, but need not be a lifetime exposure. Generally, exposures must continue for several years to be considered chronic. Intakes less than the RfD are not likely to cause adverse health effects. Chronic daily intakes greater than the RfD indicate a possibility for adverse effects. Whether such exposures actually produce adverse effects, however, is a function of a number of factors such as accuracy of uncertainty factors applied to the NOAEL, appropriateness of animal models used in studies extrapolated to humans, and potential for the chemical to cause effects in organs or systems (e.g., reproductive and immune systems) that have not been adequately studied. Generally, protective assumptions made by USEPA in deriving RfDs will, in most cases, mean that exposures slightly in excess of the RfD will be associated with a low risk for adverse effects, with the probability of adverse effects increasing with increasing exposure.

RfDs can be generated for subchronic exposures as well as chronic exposures. Subchronic is generally assumed to be exposures of several weeks to a few years. Since construction workers at the site are expected to be exposed for no more than 60 days (see Table 3-2), a subchronic reference dose is most appropriate for assessing risks to these receptors. Subchronic RfDs are derived in the same manner as RfDs for chronic exposure, except that data from shorter term animal studies, or human exposures, are used.

EPA has not published conventional quantitative toxicity criteria for lead because available data suggest a very low or possibly no threshold for adverse effects, even at exposure levels that might be considered background. Any significant increase above such background exposures could represent a cause for some concern. In lieu of evaluating risk using typical intake calculations and toxicity criteria, DTSC has developed a spreadsheet model for prediction of blood-lead levels in receptors exposed to lead from a variety of sources, including soil, dust, air, and water. Estimated blood-lead levels are compared to target blood-lead concentrations to assess possible risks. This model is further discussed in Section 5.

Inhalation toxicity values for some of the constituents at the site are provided in Tables 4-3 and 4-4.

Table 4-1
Cancer Toxicity Data - Oral/Dermal
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units	(1)	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,2-DICHLOROETHANE	9.1E-02	mg/kg/day-1	10%	9.1E-03	mg/kg/day-1	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	5.4E-03	mg/kg/day-1	10%	5.4E-04	mg/kg/day-1	2B	OEHHA	11/30/2006
1,4-DIOXANE	2.7E-02	mg/kg/day-1	3%	8.1E-04	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZENE	1.0E-01	mg/kg/day-1	10%	1.0E-02	mg/kg/day-1	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.2E+00	mg/kg/day-1	15%	1.8E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.2E+01	mg/kg/day-1	15%	1.8E+00	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.2E+00	mg/kg/day-1	15%	1.8E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E-02	mg/kg/day-1	10%	1.4E-03	mg/kg/day-1	B2	IRIS	11/30/2006
CARBON TETRACHLORIDE	1.5E-01	mg/kg/day-1	10%	1.5E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
CHLOROFORM	3.1E-02	mg/kg/day-1	10%	3.1E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
DIELDRIN	1.6E+01	mg/kg/day-1	5%	8.0E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
LEAD	8.5E-03	mg/kg/day-1	1%	8.5E-05	mg/kg/day-1	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.4E-02	mg/kg/day-1	10%	1.4E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
NAPHTHALENE	1.2E-01	mg/kg/day-1	15%	1.8E-02	mg/kg/day-1	C	EPA-Region 9	10/01/2004
PCB-1254 (AROCLOR 1254)	5.0E+00	mg/kg/day-1	15%	7.5E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
TETRACHLOROETHENE	5.4E-01	mg/kg/day-1	10%	5.4E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	7.6E-03	mg/kg/day-1	10%	7.6E-04	mg/kg/day-1		EPA-Region 9	10/01/2004
TRICHLOROETHENE	1.3E-02	mg/kg/day-1	10%	1.3E-03	mg/kg/day-1	2A	OEHHA	11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was conservatively selected as 100%.
OEHHA: Office of Health Hazard Assessment online toxicity database
EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables
IRIS: USEPA Integrated Risk Information System online toxicity database
na: No value is available.
mg/kg/day-1: milligram per kilogram-day.
IARC: International Agency for Research on Cancer

A: Human Carcinogen
2A: IARC designation for probably carcinogenic to humans
B: Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).
2B: IARC designation for possibly carcinogenic to humans
C: Possible Human Carcinogen.

Table 4-2
Non-cancer Toxicity Data - Oral/Dermal
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.8E-01	mg/kg/day	10%	2.8E+00	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	CNS	10	IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day	Liver toxicity	100	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	3.0E-02	mg/kg/day	10%	3.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DIOXANE	chronic	NA	mg/kg/day	3%	NA	mg/kg/day				11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	6.0E-01	mg/kg/day	10%	6.0E+00	mg/kg/day	Dec. offspring weight	1,000	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Pulmonary alveolar proteinosis	1,000	IRIS	11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
ACETONE	chronic	9.0E-01	mg/kg/day	10%	9.0E+00	mg/kg/day	Kidney	1,000	IRIS	11/30/2006
BENZENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Dec. lymphocyte count	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day	Inc. liver weight	1,000	IRIS	11/30/2006
CARBON DISULFIDE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Fetal toxicity	100	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	7.0E-04	mg/kg/day	10%	7.0E-03	mg/kg/day	Liver lesions	1,000	IRIS	11/30/2006
CHLOROFORM	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver	100	IRIS	11/30/2006
CHROMIUM	chronic	1.5E+00	mg/kg/day	1%	1.5E+02	mg/kg/day	None	100	IRIS	11/30/2006
CHROMIUM VI	chronic	3.0E-03	mg/kg/day		NA	mg/kg/day	None	300	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/kg/day	10%	2.0E+00	mg/kg/day	Dec. body weight	100	IRIS	11/30/2006
DIELDRIN	chronic	5.0E-05	mg/kg/day	5%	1.0E-03	mg/kg/day	Liver	100	IRIS	11/30/2006
ETHYLBENZENE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Liver and kidney toxicity	1,000	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	1.1E+01	mg/kg/day	10%	1.1E+02	mg/kg/day			EPA-Region 9	10/01/2004
IRON	chronic	3.0E-01	mg/kg/day	1%	3.0E+01	mg/kg/day			EPA-Region 9	10/01/2004
LEAD	chronic	NA	mg/kg/day	1%	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	6.0E-02	mg/kg/day	10%	6.0E-01	mg/kg/day			IRIS	11/30/2006
NAPHTHALENE	chronic	2.0E-02	mg/kg/day	15%	1.3E-01	mg/kg/day	Dec. body weight in males	3,000	IRIS	11/30/2006
PCB-1254 (AROCLOR 1254)	chronic	2.0E-05	mg/kg/day	15%	1.3E-04	mg/kg/day	Ocular exudate	300	IRIS	11/30/2006
PHENANTHRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver toxicity in mice	1,000	IRIS	11/30/2006
TETRAHYDROFURAN	chronic	2.1E-01	mg/kg/day	10%	2.1E+00	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	8.0E-02	mg/kg/day	10%	8.0E-01	mg/kg/day	Inc. kidney weight	3,000	IRIS	11/30/2006
TRICHLOROETHENE	chronic	3.0E-04	mg/kg/day	10%	3.0E-03	mg/kg/day			EPA-Region 9	10/01/2004
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	Survival and histopathology	1,000	IRIS	11/30/2006

Footnotes:
(1) Oral Absorption Efficiency for Dermal contact was conservatively selected as 100%.
EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables
IRIS: USEPA Integrated Risk Information System online toxicity database
na: No value is available.
CNS: Central Nervous System.
mg/kg/day: milligram per kilogram per day.

Table 4-3
Cancer Toxicity Data - Inhalation
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,2-DICHLOROETHANE	2.6E-05	(ug/m3)-1	9.1E-02	mg/kg/day-1	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	1.1E-05	(ug/m3)-1	4.0E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
1,4-DIOXANE	7.7E-06	(ug/m3)-1	2.7E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZENE	2.9E-05	(ug/m3)-1	1.0E-01	mg/kg/day-1	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.1E-04	(ug/m3)-1	3.9E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.1E-03	(ug/m3)-1	3.9E+00	mg/kg/day-1	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.1E-04	(ug/m3)-1	3.9E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	2.4E-06	(ug/m3)-1	8.4E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
CARBON TETRACHLORIDE	4.3E-05	(ug/m3)-1	1.5E-01	mg/kg/day-1	B2	OEHHA	11/30/2006
CHLOROFORM	2.3E-05	(ug/m3)-1	8.1E-02	mg/kg/day-1	B2	IRIS	11/30/2006
CHROMIUM VI	1.5E-01	(ug/m3)-1	5.1E+02	mg/kg/day-1	A	OEHHA	11/30/2006
DIELDRIN	4.6E-03	(ug/m3)-1	1.6E+01	mg/kg/day-1	B2	OEHHA	11/30/2006
LEAD	1.2E-05	(ug/m3)-1	4.2E-02	mg/kg/day-1	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.0E-06	(ug/m3)-1	3.5E-03	mg/kg/day-1	B2	OEHHA	11/30/2006
NAPHTHALENE	3.4E-05	(ug/m3)-1	1.2E-01	mg/kg/day-1	C	OEHHA	11/30/2006
PCB-1254 (AROCLOR 1254)	5.7E-04	(ug/m3)-1	2.0E+00	mg/kg/day-1	B2	IRIS	11/30/2006
TETRACHLOROETHENE	5.9E-06	(ug/m3)-1	2.1E-02	mg/kg/day-1	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	1.9E-06	(ug/m3)-1	6.8E-03	mg/kg/day-1		EPA-Region 9	10/01/2004
TRICHLOROETHENE	2.0E-06	(ug/m3)-1	7.00E-03	mg/kg/day-1	2A	OEHHA	11/30/2006

Footnotes:

OEHHA: Office of Health Hazard Assessment online toxicity database

EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables

IRIS: USEPA Integrated Risk Information System online toxicity database

na: No value is available

$(ug/m^3)^{-1}$: cubic meter per microgram

$mg/kg/day^{-1}$: milligram per kilogram-day

IARC: International Agency for Research on Cancer

A: Human Carcinogen

B: Probable Human Carcinogen. This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of adequate data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

2B: IARC designation for possibly carcinogenic to humans

C: Possible Human Carcinogen

Table 4-4
Non-cancer Toxicity Data - Inhalation
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Inhalation RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.2E+00	mg/m3	6.3E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
1,1-DICHLOROETHENE	chronic	2.0E-01	mg/m3	5.7E-02	mg/kg/day	Liver toxicity	30	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	6.0E-03	mg/m3	1.7E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	4.9E-03	mg/m3	1.4E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	8.0E-01	mg/m3	2.3E-01	mg/kg/day	CNS, RESP, liver, kidney	100	OEHHA	11/30/2006
1,4-DIOXANE	chronic	3.0E+00	mg/m3	8.6E-01	mg/kg/day	ALIM, Kidney, CVS		OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	5.0E+00	mg/m3	1.4E+00	mg/kg/day	DEV	300	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
ACETONE	chronic	3.2E+00	mg/m3	9.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
BENZENE	chronic	3.0E-02	mg/m3	8.6E-03	mg/kg/day	Hematopoetic system, DEV, CNS,	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	7.0E-02	mg/m3	2.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
CARBON DISULFIDE	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day	Peripheral nervous system	30	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	4.0E-02	mg/m3	1.1E-02	mg/kg/day	ALIM, DEV, CNS		OEHHA	11/30/2006
CHLOROFORM	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day	ALIM, Kidney, DEV		OEHHA	11/30/2006
CHROMIUM	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
CHROMIUM VI	chronic	8.0E-06	mg/m3	2.3E-06	mg/kg/day	RESP	90	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/m3	5.7E-02	mg/kg/day			EPA-Region 9	10/01/2004
DIELDRIN	chronic	1.8E-04	mg/m3	5.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
ETHYLBENZENE	chronic	1.0E+00	mg/m3	2.9E-01	mg/kg/day	DEV, ALIM, liver, kidney, endocrine	300	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day	Peripheral necropathy	300	IRIS	11/30/2006
IRON	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
LEAD	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	4.0E-01	mg/m3	1.1E-01	mg/kg/day	CVS, CNS		OEHHA	11/30/2006
NAPHTHALENE	chronic	3.0E-03	mg/m3	8.5E-04	mg/kg/day	RESP	3000	IRIS	11/30/2006
PCB-1254 (AROCLOR 1254)	chronic	7.0E-05	mg/m3	2.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
PHENANTHRENE	chronic	NA	mg/m3	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	3.5E-02	mg/m3	1.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
TETRAHYDROFURAN	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	3.0E-01	mg/m3	8.6E-02	mg/kg/day	CNS, RESP, DEV	10	OEHHA	11/30/2006
TRICHLOROETHENE	chronic	6.0E-01	mg/m3	1.7E-01	mg/kg/day	CNS, eyes		OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	7.0E-01	mg/m3	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004

Footnotes:
EPA-Region 9: USEPA Region IX Preliminary Remediation Goals Tables
IRIS: USEPA Integrated Risk Information System online toxicity database
na: No value is available.
mg/m3: milligram per cubic meter.
mg/kg/day: milligram per kilogram per day.

CNS: Central Nervous system
CVS: Cadiovascular system
RESP: Respiratory system
ALIM: Alimentary system
DEV: Developmental

Section 5
Risk Characterization

In the final step of risk assessment, exposure estimates are combined with toxicity criteria presented in the toxicity assessment to estimate carcinogenic risks and noncarcinogenic hazards. EPA Risk Assessment Guidance for Superfund (RAGS) calculations are used to evaluate the risks. Lead (Pb) is an exception. Potential health hazards associated with exposure to lead are estimated using the Adult Lead Methodology as discussed in Section 3.

Equations used for risk and hazards calculations are presented below.

5.1 Risk Equations

Potential cancer risks and potential non-cancer hazards are separately calculated using standard methods from EPA as described in the following sections.

5.1.1 Cancer Risks

Cancer risks are estimated by multiplying exposure estimates for carcinogenic chemicals by corresponding cancer slope factors. The result is a risk estimate expressed as the incremental odds of developing cancer. Commonly, risks (or odds) of developing cancer of one to 100 in one million (1×10^{-6} to 1×10^{-4}) or less are considered to fall within a potentially acceptable range, although decisions on the need for remediation or mitigation are made on a site-by-site basis. Lower risks are typically considered de minimis, while higher risks are often deemed unacceptable (EPA, 1992). In such instances, mitigation of risks may be considered necessary.

Carcinogenic risks are estimated as the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens (EPA, 1989). The estimated risk is expressed as a unitless probability. The equation for calculating the potential excess cancer risk for each carcinogenic chemical is:

$$\text{Risk}_i = CDI_i \times \text{CSF}_i$$

Where:

Risk_i = Lifetime Excess Cancer Risk from exposure to chemical_i

CDI_i = Chronic Daily Intake for chemical_i in milligrams per kilograms per day (mg/kg-day)

CSF_i = Inhalation Cancer Slope Factor $(\text{mg/kg-day})^{-1}$

An estimate of an individual's incremental excess cancer risk from potential exposure to multiple chemicals emitted from the site is then calculated by summing the chemical-specific excess cancer risks (i.e., Total risk = $\Sigma\, \text{Risk}_i$).

5.1.2 Chronic Non-Cancer Hazards

Chronic non-cancer hazard indices are calculated by dividing exposure estimates by reference doses. As discussed in Section 4, Non-Cancer Reference Doses, reference doses are estimates of highest exposure levels that would not cause adverse health effects even if exposures continue over a lifetime. The ratio of exposure to reference dose is termed the hazard quotient (HQ). A HQ greater than one indicates an exposure greater than that considered safe. Risks or odds of adverse effects cannot be estimated using references doses. However, because reference doses are developed in a conservative fashion, HQs only slightly higher than one are generally accepted as being associated with low risks (or even no risk) of adverse effects, and that potential for adverse effects increases as the HQ gets larger.

Impacts of exposure to multiple chemicals are accounted for by adding estimated HQs for non-carcinogenic chemicals that affect the same target organ or tissue in the body. Addition of HQs for COPCs that produce effects in similar organs and tissues results in a HI that reflects possible cumulative hazards.

For COPCs that are not classified as carcinogens and for those carcinogens known to cause adverse health effects in addition to cancer, the potential for exposure to result in non-carcinogenic effects is evaluated by comparing estimated daily dose to the chemical-specific non-cancer RfD. The non-cancer RfD represents the average daily exposure concentrations at (or below) which no adverse health effects are anticipated.

When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient. To evaluate the potential for non-carcinogenic adverse health effects from simultaneous exposure to multiple chemicals, hazard quotients for all chemicals that affect the same target organs are summed yielding hazard indices (HI).

Equations for calculating the chemical-specific hazard quotients and the overall hazard index are:

$$HQ_i = \frac{CDI_i}{RfD_i}$$

$$HI = \Sigma\, HQ_i$$

Where:

HI = Hazard Index

HQ_i = Hazard Quotient for individual $chemical_i$

CDI_i = Chronic daily intake for $chemical_i$ (mg/kg-day)

RfD_i = Chronic Non-cancer Inhalation Reference Dose for $chemical_i$ (mg/kg-day)

5.2 Risk Characterization Results

Cancer risks and non-cancer hazards for receptors at the Site are summarized in Table 5-1. The risk calculation spreadsheets are provided in Appendix A.

5.2.1 Cancer Risks

Total cancer risk estimates for the commercial/industrial worker on the Site parcel (CTE, 6E-5 and RME, 8E-5) are above the point of departure of one in one million but within the EPA risk range. Total cancer risk estimates for the construction worker (CTE, 2E-6 and RME, 5E-6) on the Site parcel are above the point of departure of one in one million but within the lower end of the EPA risk range. Cancer risks for the industrial/commercial worker are primarily attributable to inhalation of indoor air. Construction workers were only assessed for exposure to contaminated soils. The following discussions separately describe risks associated with soil and indoor air exposure in more detail.

Risks Associated With Soil Exposure

Risks associated with surface soil exposure only account for 2 percent of the total cancer risks for the commercial/industrial worker and are within the lower end of the EPA risk range (1E-6). For construction workers, the risks associated with oral and dermal exposure to surface and subsurface soil and inhalation of fugitive dust are also within the lower end of the EPA risk range (CTE, 2E-6 and RME, 4E-6).

Risks associated with surface soil exposure for the commercial/industrial worker are not likely to be realized. In a commercial/industrial setting, most of the surface soil at the site will be covered by buildings, concrete/asphalt driveways, and landscaped grounds. Little bare soil would be available for contact and estimated risks for this pathway are greatly exaggerated.

Risks related to possible exposure to soil and subsurface soil for construction workers are also not likely to be realized. PCE accounts for about 80 percent of the cancer risk for construction workers (both CTE and RME). PCE is highly volatile and will volatilize quickly from soils exposed during excavation. Some initial exposure of construction workers could be possible, but this exposure is unlikely to continue for the full exposure duration..

Although risks associated with possible soil exposure were estimated only for the Omega Site parcel , these risks can serve as upper bound estimates for exposure to soils for the other parcels. Site-related contamination is likely to be highest near source areas at the site, and similar or lower levels of COPCs are anticipated in adjacent properties that were not sampled. Thus, minimal risks from exposure to site-related chemicals in soils are expected in surrounding parcels.

Risks Associated With Indoor Air Exposure

Potential inhalation of indoor air is the primary contributor to cancer risks (CTE, 6E-5 and RME, 8E-5) for an industrial/commercial worker on the Omega Site parcel. Inhalation of benzene accounts for 40 percent of the cancer risk while inhalation of methylene chloride account for 37 percent of the cancer risk for

commercial/industrial workers. Inhalation of PCE accounts for 15 percent of the risk. Onsite, sources at Star Auto Body and/or 3 Kings Construction could be responsible for some or all of the benzene detected in indoor air. However, available data do not allow differentiation of subsurface and building sources for this parcel.

For the other five parcels, cancer risks were assessed only for the inhalation of vapors intruding into indoor air. Inhalation cancer risks for the other five parcels were either equivalent or below the inhalation risks calculated for the Site parcel. All inhalation cancer risks were above the point of departure of one in one million but within the EPA risk range.

Inhalation cancer risks for the five parcels are summarized as follows. Cancer risks for the north parcel (CTE, 2E-5 and RME, 3E-5) are primarily attributable to exposure to PCE (54 percent) with lesser contributions from carbon tetrachloride (14 percent), benzene (12 percent), and TCE (11 percent). Cancer risks for the west parcel (CTE, 6E-5 and RME, 8E-5) are primarily attributable to exposure to PCE (87 percent) with lesser contributions from carbon tetrachloride (4 percent) and benzene (6 percent). Cancer risks for the south parcel – Bishop (CTE, 2E-5 and RME, 3E-5) are primarily attributable to exposure to PCE (71 percent) with lesser contributions from carbon tetrachloride (10 percent) and benzene (15 percent). Cancer risks for the south parcel – Skateland (CTE, 1E-5 and RME, 2E-5) are primarily attributable to exposure to PCE (84 percent) with a lesser contribution from TCE (16 percent). Cancer risks for the south parcel – LA Carts/Oncology Care (CTE, 1E-5 and RME, 1E-5) are primarily attributable to exposure to benzene (46 percent) with lesser contributions from carbon tetrachloride (18 percent) and chloroform (12 percent).

Benzene and carbon tetrachloride are observed in similar concentrations in ambient air and indoor air for parcels other than the Omegas site itself. Ambient levels of benzene were reported between 0.25 and 0.34 ppbv (0.8 to 1.09 $\mu g/m^3$), compared to indoor air concentrations for adjacent parcels (0.28 to 0.68 ppbv [0.89 to 2.17 $\mu g/m^3$], with only one value concentration above 0.39 ppbv [1.25 $\mu g/m^3$]). Ambient concentrations of carbon tetrachloride ranged from 0.078 to 0.1 ppbv (0.5 to 0.63 $\mu g/m^3$), compared to indoor air concentrations ranging from 0.079 to 0.13 ppbv (0.5 to 0.82 $\mu g/m^3$). Further, carbon tetrachloride is reported infrequently in the subsurface (once among 46 shallow soil gas samples: carbon tetrachloride in the subsurface does not appear to represent a significant source. Indoor air concentrations of benzene and carbon tetrachloride may well have their source in ambient air rather than soil vapors. This interpretation is supported by the lack of PCE and other chemicals in indoor air in the LA Carts/Oncology Care buildings. These VOCs are found in very high concentrations along with benzene and carbon tetrachloride in soil gas. One would expect to find these other VOCs along with benzene and carbon tetrachloride in indoor air if subsurface vapors were intruding into buildings.

Chloroform, though detected in soil gas and groundwater, is also common in municipal water as a result of chlorination, and is a common indoor air contaminant. Chloroform concentrations detected in indoor air are relatively low (0.029 to 0.14 ppbv,0.14 to 0.68 $\mu g/m^3$) and are certainly consistent with a source in municipal

water. Again, this interpretation is supported by the lack of PCE and other chemicals in indoor air in the LA Carts/Oncology Care buildings. These VOCs are found in very high concentrations along with chloroform in soil gas. One would expect to find these other VOCs along with chloroform in indoor air if subsurface vapors were intruding into buildings. Chloroform was not reported in ambient air samples. Without the contributions of benzene, carbon tetrachloride, and chloroform which could be attributable to background, inhalation cancer risks for the parcels would be as follows:

- North Parcel: CTE, 1E-5 and RME, 2E-5 (compared to CTE, 2E-5 and RME, 3E-5 with benzene, carbon tetrachloride, and chloroform)
- West Parcel: CTE, 5E-5 and RME, 7E-5 (compared to CTE, 6E-5 and RME, 8E-5 with benzene, carbon tetrachloride, and chloroform)
- South Parcel – Bishop: CTE, 1E-5 and RME, 2E-5 compared to (CTE, 2E-5 and RME, 3E-5 with benzene, carbon tetrachloride, and chloroform)
- South Parcel - LA Carts/Oncology Care: CTE, 2E-6 and RME, 3E-6 (compared to CTE, 1E-5 and RME, 1E-5 with benzene, carbon tetrachloride, and chloroform)

The above considerations suggest that background risks, unrelated to vapor intrusion of site-related contaminants is in the range of $1x10^{-5}$. Such risks suggest that incremental risks possibly related to site contamination are a significant portion of total risks associated with VOCs in indoor air. Background risks account for essentially all risks at the LA Carts/Oncology Care buildings and 12 to 33 percent of total risks for surrounding parcels.

5.2.2 Chronic Non-Cancer Hazards

Total hazard indices for the construction worker (both CTE, 0.1 and RME, 0.3) are less than the target HI of one, indicating that non-cancer hazards at the site are negligible for this receptor. However, the chronic non-cancer hazards for the commercial/industrial worker (2.4 (CTE) and 3.4 (RME)) are above the threshold of 1. HIs for the commercial/industrial worker are primarily attributable to inhalation of indoor air. The following discussions separately describe the hazards associated with soil exposure and indoor air in more detail.

Hazards Associated With Soil Exposure

Hazards associated with surface soil exposure only account for 3 percent of the total HIs for the commercial/industrial worker and below the target threshold of one. For construction workers, the HIs associated with oral and dermal exposure to surface and subsurface soil and inhalation of fugitive dust are below the target threshold of one (CTE, 0.1 and RME, 0.3).

Risks associated with surface soil exposure for the commercial/industrial worker are not likely to be realized. In a commercial/industrial setting, most of the surface soil at the site will be covered by buildings, concrete/asphalt driveways, and landscaped

grounds. Little bare soil would be available for contact and estimated risks for this pathway are greatly exaggerated.

Noncancer hazards related to possible exposure to soil and subsurface soil for construction workers are not likely to be realized. These risks are due primarily to potential exposure to TCE (49 percent). TCE is highly volatile and will volatilize quickly from soils exposed during excavation. Some initial exposure of construction workers could be possible, but this exposure is unlikely to continue for the full exposure duration.

In addition, risks estimated for the Omega site for possible exposure to soils can serve as upper bound estimates for exposure to soils for the other parcels. Site-related contamination is likely to be highest near source areas at the site, and similar or lower levels of COPCs are anticipated in surrounding parcels that were not sampled. Thus, minimal risks from exposure to site-related chemicals in soils are expected in surrounding parcels.

Hazards Associated With Indoor Air Exposure
The highest HQs for the Site parcel are attributable to inhalation exposure to toluene and acetone, which account for 63 and 18 percent of site-related HIs for the commercial/industrial worker, respectively. When the total HI is divided by target organ, HI associated with kidneys is the largest portion (82 percent of the total HI, or an HI of 1.9, CTE and 2.8, RME). HIs for all other organs are less than the threshold of 1.For the other five parcels, HIs were assessed only for the inhalation of vapors intruding into indoor air. Inhalation HIs for the other five parcels were all below the HIs for the site parcel and less than or equivalent to the target HI of one, indicating that non-cancer hazards at these parcels are minimal.

Inhalation HIs for the five parcels are summarized as follows. HIs for the north parcel (CTE, 0.4 and RME, 0.6) are primarily attributable to exposure to acetone (57 percent) with a lesser contribution from PCE (34 percent). HIs for the west parcel (CTE, 0.7 and RME, 1.0) are primarily attributable to exposure to PCE (93 percent). HIs for the south parcel – Bishop (CTE, 0.2 and RME, 0.3) are primarily attributable to exposure to PCE (83 percent) with a lesser contribution from 1,1-DCE (7 percent). HIs for the south parcel – LA Carts/Oncology Care (CTE, 0.6 and RME, 0.8) are primarily attributable to exposure to toluene (76 percent) with a lesser contribution from acetone (15 percent). HIs for the south parcel – Skateland (CTE, 0.4 and RME, 0.6) are primarily attributable to exposure to 1,1-DCE (60 percent) with a lesser contribution from PCE (27 percent).

5.2.3 Risks Associated with Lead Exposure

Ingestion of soil by the commercial/industrial worker would likely be incidental from hand to mouth activities. The EPA Adult Lead Methodology was used to assess exposure to lead. The lead model was adjusted for the exposure frequency discussed in Section 3 and the 95% UCL for lead detected in surface soil (44.4 mg/kg).

The model results indicate that the geometric mean blood lead concentration might range from 1.6 to 1.8 μg/dl for an adult worker. The 95th percentile blood lead concentration of a fetus in an adult worker would range from 5.0 to 6.5 μg/dl. This range is considerably below a typical target of 10 μg/dL. More importantly, the probability that fetal blood levels for pregnant adult worker would exceed the target of 10 μg/dL is 0.5% to 1.6%. Where the probability of exceeding 10 μg/dL is 5 percent or less, lead exposures are typically deemed to fall into an acceptable range. Therefore, risks due to lead exposure do not appear to be sufficiently high to warrant action.

5.3 Health Based Risk Goals (HBRGs)

Health based risk goals (HBRGs) can be used as guidelines to screen chemical concentrations in media for potential risks. HBRGs conform to EPA Risk Assessment Guidance for Superfund Volume 1, Part B (1991a). They do not automatically represent remediation levels nor do they establish that cleanup action to meet these HBRGs is warranted (EPA 1991). Remediation levels to be used in cleanup activities are selected by the remedial project manager (RPM) following review of site-specific and other considerations, such as availability of data, regional information, uncertainties, and future site use. Action levels may reasonably be selected from the ranges of HBRGs presented in this report.

HBRGs are developed for carcinogenic and noncarcinogenic risks for commercial land use and RME and CTE exposure scenarios. HBRGs were calculated only for those COPCs for soil and indoor air that had individual cancer risks above 10^{-7} or a hazard above 0.1. These COPCs are likely most important for risk management. By determining acceptable risk (i.e., 1E-06 cancer risk) and combining this with exposure assumptions, it is possible to calculate the average media concentration that results in the selected target risk. This medium concentration, which represents the average concentration across the exposure unit, is the health risk-based goal. HBRG equations combine intakes from the exposure pathways being evaluated, and thus the resulting HBRGs should be protective for total exposures from those pathways.

To calculate HBRGs, target cancer risks or HIs are input to the equations for back calculation to a media concentration. HBRGs are basically the reverse of risk assessment calculations. These calculations use a selected acceptable risk (i.e., a cancer risk of one in one million and a hazard index of 1), exposure variables, and chemical toxicity factors to determine the medium-specific chemical concentration resulting in the selected risk. Media of concern, COPCs, receptor populations, potential exposure pathways and exposure assumptions for receptors were defined in Section 3. HBRGs calculated for the site are summarized in Table 5-2 with full calculations provided in Appendix A.

Exposure assumptions and calculations did not vary among parcels, thus HBRGs for indoor air are applicable for all buildings at the site currently, and for any future buildings that may be constructed. Likewise, although soil data were limited to the Omega site and its boundaries, exposure assumptions and calculations would be the same for surrounding parcels. Thus, HBRGs for soil are also applicable to all parcels.

However, risks and hazards potential associated with direct contact with surface soils are based on assumed exposure to volatile chemicals by commercial/industrial workers. Volatile chemicals will not remain in surface soils for chronic exposure durations, and risks and hazards presented for VOCs in this report are artificially high.

Table 5-1
Summary of Chronic Cancer Risks and Chronic Non-Cancer Hazards

Receptor	Exposure Pathway	PARCEL Site		PARCEL North		PARCEL West		PARCEL South - Bishop		PARCEL South - LA Carts/Oncology Care		PARCEL South - Skateland [1]	
		Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]	Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]	Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]	Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]	Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]	Total Chronic Cancer Risk[3]	Total Chronic Non-Cancer Hazard[3]
Commercial/Industrial worker CTE	**Soil** – Oral/Dermal	1.E-06	0.1	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA(2)	NA(2)	NA[2]	NA[2]
	Indoor Air – Inhalation Pathway[1]	6.E-05	2.3	2.E-05 (1.E-05)	0.4	6.E-05 (5.E-05)	0.7	2.E-05 (1.E-05)	0.2	1.E-05 (2.E-06)	0.6	1.E-05	0.4
	TOTAL	**6.E-05**	**2.4**	**2.E-05**	**0.4**	**6.E-05**	**0.7**	**2.E-05**	**0.2**	**1.E-05**	**0.6**	**1.E-05**	**0.4**
Commercial/Industrial worker RME	**Soil** – Oral/Dermal	1.E-06	0.1	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA(2)	NA(2)	NA[2]	NA[2]
	Indoor Air – Inhalation Pathway[1]	8.E-05	2.3	3.E-05 (2.E-05)	0.6	8.E-05 (7.E-05)	1.0	3.E-05 (2.E-05)	0.3	1.E-05 (3.E-06)	0.8	2.E-05	0.6
	TOTAL	**8.E-05**	**3.4**	**3.E-05**	**0.6**	**8.E-05**	**1.0**	**3.E-05**	**0.3**	**1.E-05**	**0.8**	**2.E-05**	**0.6**
Construction Worker CTE	**Soil** – Oral/Dermal, Inhalation of Fugitive Dust	**2.E-06**	**0.1**	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA(2)	NA(2)	NA[2]	NA[2]
Construction Worker RME	**Soil** – Oral /Dermal, Inhalation of Fugitive Dust	**4.E-06**	**0.3**	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA[2]	NA(2)	NA(2)	NA[2]	NA[2]

(1) Indoor air pathway for Skateland was calculated using measured soil gas data instead of indoor air data because existing building is soon to be demolished and measured indoor air values are thus irrelevant.
(2) Soil pathways not calculated separately for the parcels
(3) Values in parentheses indicate risks without the contributions of benzene, carbon tetrachloride, and chloroform, which could be attributable to background.

Table 5-2
Summary of Carcinogenic and Non-Carcinogenic HBRGs for COPCs
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker and Construction Worker
Receptor:	Adult

Target Risk	1.0E-06
Target Hazard	2.0E-01

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	HBRG for Exposure Point					HBRG For Original Medium		Comparison of Calculated HBRG to Existing Screening Level (1)	
				Industrial CTE	Industrial RME	Construction CTE	Construction RME	Receptor Minimum	Value	Units	Screening Level	Notes
Soil	Soil	Soil	BENZO(A)PYRENE	NA	NA	1.4E+01	5.2E+00	5.2E+00	5.2E+00	mg/kg	2.11E-01	OK
			BIS(2-ETHYLHEXYL)PHTHALATE	3.1E+02	3.1E+02	NA	NA	3.1E+02	3.1E+02	mg/kg	1.23E+02	OK
			DIELDRIN	NA	3.6E-01	NA	NA	3.6E-01	3.6E-01	mg/kg	1.08E-01	OK
			LEAD	NA	6.7E+02	NA	NA	6.7E+02	6.7E+02	mg/kg	8.00E+02	PRG less stringent
			NAPHTHALENE	NA	2.4E+01	NA	NA	2.4E+01	2.4E+01	mg/kg	4.20E+00	OK
			PCB-1254 (AROCLOR 1254)	5.8E-01	5.8E-01	NA	NA	5.8E-01	5.8E-01	mg/kg	7.44E-01	PRG less stringent
			TETRACHLOROETHENE	NA	NA	4.5E+02	1.2E+02	1.2E+02	1.2E+02	mg/kg	1.31E+00	OK
			TRICHLOROETHENE	NA	NA	NA	2.7E+02	2.7E+02	2.7E+02	mg/kg	6.47E+00	OK
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	6.1E+02	6.1E+02	NA	NA	6.1E+02	6.1E+02	ug/m^3	---	No CHHSL
			1,2-DICHLOROETHANE	3.3E-01	3.3E-01	NA	NA	3.3E-01	3.3E-01	ug/m^3	1.95E-01	OK
			1,4-DICHLOROBENZENE	7.5E-01	7.5E-01	NA	NA	7.5E-01	7.5E-01	ug/m^3	---	No CHHSL
			ACETONE	9.6E+03	9.6E+03	NA	NA	9.6E+03	9.6E+03	ug/m^3	---	No CHHSL
			BENZENE	3.0E-01	3.0E-01	NA	NA	3.0E-01	3.0E-01	ug/m^3	1.41E-01	OK
			CARBON TETRACHLORIDE	2.0E-01	2.0E-01	NA	NA	2.0E-01	2.0E-01	ug/m^3	9.73E-02	OK
			CHLOROFORM	3.7E-01	3.7E-01	NA	NA	3.7E-01	3.7E-01	ug/m^3	---	No CHHSL
			METHYLENE CHLORIDE	8.5E+00	8.5E+00	NA	NA	8.5E+00	8.5E+00	ug/m^3	---	No CHHSL
			TETRACHLOROETHENE	1.4E+00	1.4E+00	NA	NA	1.4E+00	1.4E+00	ug/m^3	6.93E-01	OK
			TOLUENE	9.1E+02	9.1E+02	NA	NA	9.1E+02	9.1E+02	ug/m^3	4.38E+02	OK
			TRICHLOROETHENE	4.3E+00	4.3E+00	NA	NA	4.3E+00	4.3E+00	ug/m^3	2.04E+00	OK

NA: Not applicable, not a COPC for the pathway or the receptor scenario
OK: indicates that HBRG is higher than screening level
HBRG: Health based risk goal
CHHSL: California Human Health Screening Level
PRG: Preliminary Remediation Goal
ug/m^3: microgram per cubic meter
mg/kg: milligram per kilogram

(1) Screening Levels were as follows:
Indoor air screening levels are CalEPA CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
Soil screening levels are EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c)

Table 5-3
Comparison of Carcinogenic and Non-Carcinogenic HBRGs for COPCs to Parcel Maximum Detections
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker and Construction Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	HBRG For Original Medium		Maximum Detections by Parcel[1]				
				Value	Units	Site Parcel	North Parcel	West Parcel	South Parcel Bishop	South Parcel LA Carts/ Oncology Care
Soil	Soil	Soil	BENZO(A)PYRENE	5.2E+00	mg/kg	1.6E+00	NA	NA	NA	NA
			BIS(2-ETHYLHEXYL)PHTHALATE	3.1E+02	mg/kg	5.1E+01	NA	NA	NA	NA
			DIELDRIN	3.6E-01	mg/kg	5.0E-02	NA	NA	NA	NA
			LEAD	6.7E+02	mg/kg	**8.9E+02**	NA	NA	NA	NA
			NAPHTHALENE	2.4E+01	mg/kg	1.2E+00	NA	NA	NA	NA
			PCB-1254 (AROCLOR 1254)	5.8E-01	mg/kg	5.0E-01	NA	NA	NA	NA
			TETRACHLOROETHENE	1.2E+02	mg/kg	**1.3E+03**	NA	NA	NA	NA
			TRICHLOROETHENE	2.7E+02	mg/kg	1.4E+02	NA	NA	NA	NA
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	6.1E+02	ug/m^3	1.7E+01	1.0E+01	2.3E+01	1.4E+01	3.7E+00
			1,2-DICHLOROETHANE	3.3E-01	ug/m^3	NA	NA	NA	NA	3.2E-01
			1,4-DICHLOROBENZENE	7.5E-01	ug/m^3	NA	**9.0E-01**	3.0E-01	3.2E-01	3.9E-01
			ACETONE	9.6E+03	ug/m^3	5.9E+03	3.3E+03	4.3E+01	4.1E+01	1.2E+03
			BENZENE	3.0E-01	ug/m^3	**1.1E+01**	**1.1E+00**	**1.4E+00**	**1.3E+00**	**2.2E+00**
			CARBON TETRACHLORIDE	2.0E-01	ug/m^3	**6.9E-01**	**8.2E-01**	**6.9E-01**	**5.7E-01**	**5.2E-01**
			CHLOROFORM	3.7E-01	ug/m^3	2.4E-01	3.4E-01	2.4E-01	1.8E-01	**6.8E-01**
			METHYLENE CHLORIDE	8.5E+00	ug/m^3	**2.6E+02**	4.9E+00	1.5E+00	1.7E+00	5.9E+00
			TETRACHLOROETHENE	1.4E+00	ug/m^3	**3.5E+01**	**2.2E+01**	**1.0E+02**	**2.9E+01**	**1.6E+00**
			TOLUENE	9.1E+02	ug/m^3	**2.3E+03**	NA	NA	NA	5.7E+02
			TRICHLOROETHENE	4.3E+00	ug/m^3	**6.5E+00**	**1.3E+01**	**4.3E+00**	NA	NA

NA: Not applicable
HBRG: Health based risk goal
ug/m^3: microgram per cubic meter
mg/kg: milligram per kilogram

Values in **Bold** exceed their corresponding HBRG
1: Maximum detections shown for soil are for 0-30 feet bgs

Section 6
Uncertainties

6.1 Uncertainties in the Risk Assessment Process

A degree of uncertainty is associated with all phases of a risk assessment. This section describes the potential impact of uncertainties associated with the database, exposure assumptions, and toxicity assessment on the final step of the risk assessment and risk characterization. In addition, uncertainties inherent in risk characterization are identified and discussed.

6.2 Uncertainties in the Database

Site data appear to provide an adequate characterization of current conditions at the site. Numerous samples were collected across the site for all media, and in many cases sampling locations were biased towards contaminated (or formerly contaminated) areas. That is, much of the site characterization effort focused on and near known source/release areas. Moreover, more than one round of sampling was completed for each media, reducing any concerns with taking a "snap shot" of site conditions that was not representative of typical conditions. This concern is particularly relevant to soil gas and indoor air concentrations which could theoretically vary considerably over time.

COPCs for groundwater, soil, soil gas, and indoor air at the Site were selected based on a screening analysis of each chemical's potential to contribute to Site-related risks. Chemicals are screened by comparing maximum detected concentrations in site media with risk-based screening concentrations, "allowable" media concentrations based on generic exposure assumptions available from EPA (Region IX PRGs, CalEPA CHHSLs, and USEPA groundwater target concentrations for indoor air). To make this selection process more conservative, only one-tenth of the PRGs and groundwater target concentrations were used for the screening to allow for the additive effects of multiple chemicals. Since the list of chemicals with CHHSLs is short, this additional conservatism was not utilized for soil gas and indoor air samples.

Overall, available data for the site can be considered representative, or somewhat biased toward areas of contamination. COPC selection based on these data is likely to include chemicals that present little risk rather than exclude chemicals that may be of concern. Risk assessment based on available data can be used with confidence to produce a conservative (protective) evaluation of potential human health risks.

6.3 Uncertainties with Exposure Assessment

Methods used in this risk assessment are conservative; methods are used that are more likely to overestimate than underestimate possible health risks. For example, risks and hazards are calculated for individuals that are likely to be exposed at locations where COPC concentrations are predicted to be highest. Further, individuals are assumed to be exposed for almost all days of the year and for many years to maximize estimates of possible exposure. Resulting cancer risk estimates represent

upper-range predictions of exposure, and therefore health risk, which may be associated with living or working on the site. By protecting hypothetical individuals that receive the highest exposures (i.e., people living at or working at locations for which the highest emissions are predicted), the risk assessment will also be protective for actual members of the population that are not as highly exposed.

Potential risks and hazards associated with vapor intrusion were considered on a parcel-by-parcel basis, using data from indoor air sampling for existing buildings. These estimates allow better visualization of potential site-impacts at the Omega Site and at surrounding properties, as well as providing an indication of possible current Site-related health risk, if any. This approach eliminates the possibility that combining data within a larger exposure area (e.g. the Omega Site and all surrounding parcels) dilute out parcels with high and low potential for vapor intrusion.

6.3.1 Exposure Concentrations

The site is relatively small and will likely remain as single parcel; therefore, it was appropriately assessed as a single exposure unit. The same argument holds true for surrounding properties that are also relatively small and likely to remain as single parcels. Thus, separate evaluation of vapor intrusion for these parcels is also justified. Exposure point concentrations for individual is, however, subject to some uncertainty because dividing Site data by parcel reduces the size of the datasets used for EPC calculations.

Generally, 95% UCL concentrations were used as the exposure concentrations for site media. A 95% UCL is a statistic meaning that there is a 95% confidence (probability) that the concentration on the site will be at this level. For samples with non-detectable levels of a contaminant, one-half of the reporting limit is substituted when calculating the 95% UCL.

For example, PCE in indoor air is the primary COPC of concern at the site. The 95% UCL for PCE in indoor air for the Site parcel is 14.2 $\mu g/m^3$ (2.1 ppbv) while PCE concentrations detected in the 8 indoor air samples ranged from 1.0 to 34.6 $\mu g/m^3$ (0.15 to 5.1 ppbv). Only 2 of the 7 PCE detections had concentrations higher than 14.2 $\mu g/m^3$ (2.1 ppbv). It is unlikely that a receptor would spend all of his time (in the case of a commercial/industrial worker – 8 hours a day, 250 days a year for 25 years) standing at the location of the highest PCE detection. In such a manner, use of the 95% UCL as the exposure concentration provides a reasonable estimate of exposure.

In some cases, however, small datasets forced the use of the maximum detected concentration in indoor air as the EPC. Use of the maximum is likely overestimate possible indoor air concentrations. In these cases, additional conservatism may be included in risk and hazard estimates.

For a conservative estimate of potential health risks from soil gas for the former Skateland parcel, samples collected from the surface to 6 feet bgs collected from 2004 to 2006 were used to calculate the exposure concentrations for soil gas. Soil gas concentrations can vary seasonally and the availability of multiple rounds of soil gas sampling increased confidence in exposure point concentrations. Higher concentrations of some COPCs were found at greater depths bgs, but available data provide no indication that the observed vertical profile of soil gas concentrations is not representative of typical conditions at the site. That is, the profile did not change notably between sampling events. Thus, higher concentrations found below 6 feet bgs do not suggest that current modeling for vapor intrusion significantly underestimates potential risks or hazards.

6.3.2 Exposure Pathways

Risks and hazards calculated for future commercial/industrial worker soil exposure pathways assume that soil is available for contact. However, the site is currently covered by buildings and other impervious surfaces, and it is unlikely that soils would remain uncovered (i.e., bare) following redevelopment, eliminating much potential for exposure to Site soils. Therefore, risks and hazards associated with the exposure pathways of dermal contact, soil ingestion, and inhalation of particulates are ceiling estimates, and actual risks are likely to be negligible.

6.3.3 Estimates of Indoor Air Concentrations

Indoor air concentrations for the site were estimated directly from measured indoor air concentrations, except for the former Skateland parcel as discussed above. Indoor air concentrations are likely to vary during the course of a day and seasonally, and may be influenced by sources of VOCs inside of buildings and, conceivably, in ambient air. Variations in concentrations over the course of a day were addressed in the sampling by continuous sample collection over an 8-hour period, during typical work hours. These samples provide an overall daily average concentration, which is most appropriate for assessing chronic daily exposure. In addition, samples were taken in various work areas within each building to help ensure that vagaries of building ventilation did not produce spurious results. Thus, available data are reasonable estimates of daily exposure on sample collection days.

Seasonal variation was addressed by collecting samples on two or more occasions. Results from these separate sampling events were very similar for a given building. It is likely that available data reasonably describe likely indoor air quality for each of the buildings sampled. Risks estimated on the basis of measured indoor air concentrations probably fall into upper range of those possible for the site and surrounding parcels.

A final issue concerning indoor air measurements is that they cannot be used directly to estimate future indoor air concentrations should the site and/or surrounding parcels be redeveloped. While it is not possible to predict future indoor air concentrations, it is reasonable to assume that new buildings would be constructed following existing commercial building codes which are likely to require a vapor barrier and substantial ventilation. Moreover, new buildings would have intact

buildings with few if any cracks that would facilitate vapor intrusion. Thus, vapor intrusion can be predicted to be less for new construction than is suggested by current indoor air data. Also, current indoor air data are likely to include non-site-related VOCs from building and/or ambient air. Current data therefore are likely to overestimate site-related risk and hazards, and probably are even more conservative estimates of possible future indoor air concentrations. Risk estimates developed in this document can be used as conservative estimates for future vapor intrusion.

6.4 Uncertainties Associated with Toxicity Assessment

A potentially large source of uncertainty is inherent in the derivation of the EPA toxicity criteria (i.e., RfDs, and cancer slope factors). In many cases, data must be extrapolated from animals to sensitive humans by the application of uncertainty factors to an estimated NOAEL or LOAEL for non-cancer effects. While designed to be protective, it is likely in many cases that uncertainty factors overestimate the magnitude of differences that may exist between human and animals, and among humans.

In some cases, however, toxicity criteria may be based on studies that did not detect the most sensitive adverse effects. For example, many past studies have not measured possible toxic effects on the immune system. Moreover, some chemicals may cause subtle effects not easily recognized in animal studies. The effects of lead on cognitive function and behavior at very low levels of exposure serve as examples.

In addition, derivation of cancer slope factors often involves linear extrapolation of effects at high doses to potential effects at lower doses commonly seen in environmental exposure settings. Currently, it is not known whether linear extrapolation is appropriate. In all likelihood, the shape of the dose response curve for carcinogenesis varies with different chemicals and mechanisms of action. It is not possible at this time, however, to describe such differences in quantitative terms.

It is likely that the assumption of linearity is conservative and yields slope factors that are unlikely to lead to underestimation of risks. Yet, for specific chemicals, current methodology could cause slope factors, and, hence, risks, to be underestimated.

Use of CalEPA toxicity criteria could either over or underestimate potential risks, but it is difficult to determine either the direction or magnitude of any errors. In general, however, it is likely that the criteria err on the side of protectiveness for most chemicals.

6.5 Uncertainties in Risk Characterization

The current and future land use of the site was assumed to be commercial/industrial. The possibility that this site would be redeveloped for residential use is remote. Its location, surrounded by commercial/residential businesses and next to a major

arterial, make it undesirable and unlikely for residential development. Thus, the assumption of a commercial/industrial land use is reasonable and appropriate.

Also if the site were redeveloped, with the construction of new commercial/industrial facilities, the foundation of the new facilities would be new and would likely not have significant cracks (as assumed in the indoor vapor intrusion model) that would allow easy passage of soil vapors.

The risk assessment assumes that current concentrations of COPCs will remain constant into the future. Data are not available, however, to verify the appropriateness of this assumption. However, risk calculations for indoor air (which appears to be the primary pathway of concern) were based on data collected from 2004 to 2006. A review of the PCE indoor air data collected during this time period (provided in Table 6-1) shows a general decreasing trend of PCE concentrations. As such, it is likely that the risks calculated in this assessment provide an overestimate of future risks as PCE concentrations may decrease in the future. Uncertainties associated with future concentrations need to be taken into account whenever the risk estimates provided in this assessment are used in risk management decisions. They are considered equally important as the numerical estimates in providing a characterization of risk at the site.

Finally, risks and hazards calculated for exposures to construction workers to COPCs in surface soil are artificially high. They are based on VOCs that will remain in surface soil only for short periods. Risks and hazards associated with direct contact with surface soil appear to be minimal.

Table 6-1
Summary of PCE Indoor Air Data for 2004-2006
Omega Chemical Site - Whittier, California

SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	TETRACHLOROETHENE (ppbv)
OC-AA-FS-02-051104	5/11/2004	ORIG	145
OC-AA-FS-01-051104	5/11/2004	ORIG	140
OC1-LC1-G-0-11	5/11/2004	EPA	130
OC-AA-FS-05-051104	5/11/2004	ORIG	15
OC-AA-FS-06-051104	5/11/2004	ORIG	14
OC-AA-FS-07-051104	5/11/2004	ORIG	2.35
OC-AA-FS-11-051104	5/11/2004	ORIG	0.89
OC-AA-FS-09-051104	5/11/2004	ORIG	0.87
OC-AA-FS-10-051104	5/11/2004	ORIG	0.62
OC-AA-FS-13-051104	5/11/2004	ORIG	0.46
OC-AA-FS-14-051104	5/11/2004	ORIG	0.15
OC1-RC1-G-0-14	7/30/2004	EPA	24
OC1-CSR-G-0-15	7/30/2004	EPA	21.85
OC1-CSR-G-0-18	7/31/2004	EPA	85
OC1-RC1-G-0-20	7/31/2004	EPA	80
OC-IA-FS-20-080404	8/4/2004	ORIG	110
OC-IA-FS-16-080404	8/4/2004	ORIG	45
OC-IA-FS-18-080404	8/4/2004	ORIG	40
OC-IA-FS-21-080404	8/4/2004	ORIG	26
OC-IA-FS-22-080404	8/4/2004	ORIG	24
OC-IA-FS-23-080404	8/4/2004	ORIG	23
OC-IA-FS-19-080404	8/4/2004	ORIG	1.4
OC1-CSR-G-0-34	12/29/2004	EPA	14
OC1-RC1-G-0-32	12/29/2004	EPA	13
OC1-OFF-G-0-33	12/29/2004	EPA	4.3
OC-IA-FS-03-122904	12/30/2004	ORIG	12
OC-IA-FS-04-122904	12/30/2004	ORIG	12
OC-IA-FS-01-122904	12/30/2004	ORIG	11
OC-IA-FS-02-122904	12/30/2004	ORIG	9.6
OCI-OFF-G-0-38	1/12/2005	EPA	ND
OCI-CSR-G-0-36	1/12/2005	EPA	13
OC-IA-FS-04-011205	1/12/2005	ORIG	8.3
OC-IA-FS-03-011205	1/12/2005	ORIG	6.4
OC-IA-FS-02-011205	1/12/2005	ORIG	6.3
OC-IA-FS-01-011205	1/12/2005	ORIG	5.2
OCI-RCI-G-0-37	1/12/2005	EPA	5.1
OC-AA-FS-02-091405	9/14/2005	ORIG	12.5
OC-AA-FS-17-091405	9/14/2005	ORIG	12
OC-AA-FS-18-091405	9/14/2005	ORIG	10
OC-AA-FS-16-091405	9/14/2005	ORIG	8.7
OC-IA-FD-06-091405	9/14/2005	ORIG	6.6
OC-IA-FD-05-091405	9/14/2005	ORIG	5.7
OC-IA-FS-07-091405	9/14/2005	ORIG	5
OC-AA-FS-10-091405	9/14/2005	ORIG	3.3
OC-IA-FS-14-091405	9/14/2005	ORIG	1.9
OC-IA-FS-13-091405	9/14/2005	ORIG	1.1
OC-AA-FS-11-091405	9/14/2005	ORIG	0.69
OC-IA-FD-09-091405	9/14/2005	ORIG	ND
OC-IA-LAC-Sm Prod-090806	9/8/2006	ORIG	ND
OC-IA-BIS-STORE-090806	9/8/2006	ORIG	4.3
OC-IA-BIS-AO-090806	9/8/2006	ORIG	1.5
OC-IA-BIS-WHSE-090806	9/8/2006	ORIG	1
OC-IA-LAC-Lg Prod-090806	9/8/2006	ORIG	0.24
OC-IA-ONC-NS-090806	9/8/2006	ORIG	0.065
OC-IA-LAC-AO-090806	9/8/2006	ORIG	0.036
OC-IA-MN-090806	9/8/2006	ORIG	ND
OC-IA-ONC-AO-090806	9/8/2006	ORIG	ND

ppbv - parts per billion by volume

Section 7
Summary and Conclusions

The primary findings and conclusions of this risk assessment are briefly summarized in this section. The following tasks were performed as part of this risk assessment:

- Examined the history of the Omega Chemical site in Whittier, CA, and identified types of chemicals used and likely release mechanisms for these chemicals to enter the environment
- Evaluated data collected to characterize the site and existing contamination and used the most recent of these data to select chemicals of potential concern (COPCs) and to calculate exposure point concentrations
- Analyzed the potential for exposure to COPCs at the site though an evaluation of people that might be exposed, exposure pathways that might result in significant contact between these people and COPCs, and identification of exposure parameters appropriate for quantifying exposure resulting from this contact.
- Identified appropriate toxicity criteria for site COPCs
- Estimated risk to current and potential future receptors (people) that might contact contamination
- Evaluated uncertainties in data, exposure, toxicity and risk characterization aspects of the risk assessment
- Calculated health-based remediation goals (HBRGs) for use in remediation decisions for the site

Important results of the risk assessment that follow from the above assessments can be summarized as follows:

- Field investigations since 2004 provide a recent and complete site characterization. High confidence can be assigned to use of these data to select chemicals of potential concern and to estimate exposure point concentrations.
- Commercial/industrial land use is an appropriate assumption for future site use. The site has been used for such purpose since it was developed from agricultural land in the 1950's. The site is still surrounded by commercial industrial land use, is located on a major arterial, and possesses no characteristics that would suggest that would make it desirable for residential development.
- Among receptors likely to be exposed to site-related contaminants, the highest cancer risks and noncancer hazards are associated with exposure of current or potential future commercial/industrial workers.

- The pathway that suggests the highest potential for exposure involves intrusion of vapors into indoor air spaces. Inhalation of these vapors in workspaces results in the highest estimates of potential cancer risk and noncancer hazard.

- No complete exposure pathways exists that involves contact with contaminants in soils and groundwater below the 30-foot clay zone.

- PCE is the primary COPC of concern at the site. For example, inhalation of indoor air suggests potential total inhalation cancer risks ranging from 1E-05 to 8E-05. Cancer risk associated with inhalation exposure to PCE alone ranges from 1E-06 to 7E-05. Estimated hazards for PCE were relatively low, however. HQs for exposure to indoor air for PCE ranged from 0.01 to 1 compared to a total inhalation HIs ranging from 0.2 to 3.3.

- Potential risks associated with exposure to ambient (urban background) concentrations of VOCs are as high as $1x10^{-5}$ and may account for 12 to essentially 100 percent of total risks estimated for indoor exposures, depending on parcel. LA Carts/Oncology Care may not be affected by site-related VOCs. Incremental risks that could be associated with vapor intrusion are significantly less than those presented for total risks at the site..

- Hypothetical exposure to contaminants in soil is unlikely to occur, since soil in currently covered with buildings asphalt and concrete and such cover is likely to remain even if the site is redeveloped for other commercial/industrial purposes in the future. Further, volatile COPCs, in particular PCE, acetone and toluene, will not persist in soils exposed during excavation, and construction worker exposures are expected to be minimal. These VOCs were associated with the bulk of risks and hazards estimated for direct contact exposure to surface soils.

- Uncertainties in the risk assessment suggest that site-related risks have been adequately characterized to support risk management decisions. In fact, the database is biased toward source/release areas and likely overstates levels of contamination for the site as a whole.

- Site-related risks involving exposure to PCE vapors in indoor air appear to be adequately assessed using available site-specific data. All risks fall within EPA's risk range. .

- HBRGs for PCE can be used with confidence in evaluating remedial alternatives, if the site is deemed to pose an unacceptable risk.

Section 8
References

California EPA (CalEPA). 1997. *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities.* Human and Ecological Risk Division Department of Toxic Substances Control. February.

_____. 1999. DTSC. *Preliminary Endangerment Assessment Guidance Manual* (reprinted from 1994). January.

_____. 2005a. DTSC. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air.*

_____. 2005b. Office of Environmental Health Hazard Assessment (OEHHA). *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. January.

_____. 2005c. *Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil.* January revision.

_____. 2006. Online toxicity database. http://www.oehha.ca.gov/risk/ChemicalDB/index.asp

Camp Dresser & McKee Inc. 2007. Draft On-Site Soils Remedial Investigation Report. January 5.

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund, Volume I. Human Health Evaluation Manual. Interim Final. Office of Emergency and Remedial Response.* U.S. EPA. Washington, D.C. September 29, 1989.

_____. 1991. *Risk Assessment Guidance for Superfund: Volume I. Human Health Evaluation Manual. Part B, Development of Risk-Based Preliminary Remediation Goals.* Interim. U.S. EPA. Washington, D.C.

_____. 1993b. *Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure*. Draft.

_____. 1997. *Exposure Factors Handbook. Volume 1. General Factors.* Office of Research and Development. EPA/600/P-95/002Fa. August.

_____. 2001. *ProUCL- Version 2.0 [Software for Windows 95, accompanied by "ProUCL User's Guide."* Prepared for EPA by Lockheed Martin

_____. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

_____. 2003. *User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings*. March 14.

_____. 2004. *USEPA Region 9 Preliminary Remediation Goals Tables*. October.

_____. 2004. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R/99/005.

_____. 2006. *Integrated Risk Information System (IRIS)*. Online database. http://www.epa.gov/IRIS/search.htm

Appendix A
Risk Calculations

A-1 UCL Summaries

A-2 USEPA Adult Lead Model

A-3 RAGS D Tables

A-4 Johnson and Ettinger Model Calculations

A-5 HBRG Calculations

Appendix B
Arsenic Statistical Evaluation

Appendix A
Risk Calculations

A-1 UCL Summaries

A-2 USEPA Adult Lead Model

A-3 RAGS D Tables

A-4 Johnson and Ettinger Model Calculations

A-5 HBRG Calculations

Appendix A-1
UCL Summaries

A-1.1 Surface Soil 0-1.5 feet

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: 2-METHYLNAPHTHALENE

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	11
Minimum	0.045
Maximum	4
Mean	0.721136
Median	0.1
Standard Deviation	1.223785
Variance	1.49765
Coefficient of Variation	1.697023
Skewness	1.781743

Gamma Statistics	
k hat	0.468834
k star (bias corrected)	0.435205
Theta hat	1.538148
Theta star	1.657003
nu hat	20.62871
nu star	19.14903
Approx.Chi Square Value (.05)	10.22484
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	9.739115

Log-transformed Statistics	
Minimum of log data	-3.101093
Maximum of log data	1.386294
Mean of log data	-1.695425
Standard Deviation of log data	1.612781
Variance of log data	2.601062

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

3.317176

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.613569
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.170099

Gamma Distribution Test	
A-D Test Statistic	2.701112
A-D 5% Critical Value	0.811005
K-S Test Statistic	0.310717
K-S 5% Critical Value	0.196691
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.35054
Adjusted Gamma UCL	1.417897

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.784913
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2.282519
95% Chebyshev (MVUE) UCL	1.699121
97.5% Chebyshev (MVUE) UCL	2.175389
99% Chebyshev (MVUE) UCL	3.110927

95% Non-parametric UCLs	
CLT UCL	1.150298
Adj-CLT UCL (Adjusted for skewness)	1.256201
Mod-t UCL (Adjusted for skewness)	1.186617
Jackknife UCL	1.170099
Standard Bootstrap UCL	1.149319
Bootstrap-t UCL	1.360649
Hall's Bootstrap UCL	1.191284
Percentile Bootstrap UCL	1.148864
BCA Bootstrap UCL	1.429318
95% Chebyshev (Mean, Sd) UCL	1.858425
97.5% Chebyshev (Mean, Sd) UCL	2.35053
99% Chebyshev (Mean, Sd) UCL	3.317176

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: BIS(2-ETHYLHEXYL)PHTHALATE

Raw Statistics	
Number of Valid Samples	20
Number of Unique Samples	13
Minimum	0.03
Maximum	51
Mean	4.50985
Median	0.415
Standard Deviation	11.37674
Variance	129.4301
Coefficient of Variation	2.522642
Skewness	3.963996

Gamma Statistics	
k hat	0.344066
k star (bias corrected)	0.325789
Theta hat	13.10751
Theta star	13.84284
nu hat	13.76264
nu star	13.03158
Approx.Chi Square Value (.05)	5.912869
Adjusted Level of Significance	0.038
Adjusted Chi Square Value	5.536798

Log-transformed Statistics	
Minimum of log data	-3.506558
Maximum of log data	3.931826
Mean of log data	-0.453573
Standard Deviation of log data	2.082883
Variance of log data	4.3384

RECOMMENDATION

Data are lognormal (0.05)

Use 97.5% Chebyshev (MVUE) UCL

19.42963

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.426424
Shapiro-Wilk 5% Critical Value	0.905
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	8.908617

Gamma Distribution Test	
A-D Test Statistic	1.279506
A-D 5% Critical Value	0.835416
K-S Test Statistic	0.209842
K-S 5% Critical Value	0.20898
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	9.939415
Adjusted Gamma UCL	10.61452

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.927357
Shapiro-Wilk 5% Critical Value	0.905
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	44.59042
95% Chebyshev (MVUE) UCL	14.83881
97.5% Chebyshev (MVUE) UCL	19.42963
99% Chebyshev (MVUE) UCL	28.44741

95% Non-parametric UCLs	
CLT UCL	8.694218
Adj-CLT UCL (Adjusted for skewness)	11.10358
Mod-t UCL (Adjusted for skewness)	9.284428
Jackknife UCL	8.908617
Standard Bootstrap UCL	8.721665
Bootstrap-t UCL	19.91625
Hall's Bootstrap UCL	22.25379
Percentile Bootstrap UCL	9.36385
BCA Bootstrap UCL	9.11635
95% Chebyshev (Mean, Sd) UCL	15.59852
97.5% Chebyshev (Mean, Sd) UCL	20.3966
99% Chebyshev (Mean, Sd) UCL	29.82149

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: CHROMIUM

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	17
Minimum	8.3
Maximum	360
Mean	44.46818
Median	22
Standard Deviation	76.28804
Variance	5819.865
Coefficient of Variation	1.715565
Skewness	3.771119

Gamma Statistics	
k hat	1.064552
k star (bias corrected)	0.949688
Theta hat	41.77175
Theta star	46.82397
nu hat	46.84027
nu star	41.78629
Approx.Chi Square Value (.05)	27.96652
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	27.12244

Log-transformed Statistics	
Minimum of log data	2.116256
Maximum of log data	5.886104
Mean of log data	3.256453
Standard Deviation of log data	0.849049
Variance of log data	0.720885

RECOMMENDATION

Data are Non-parametric (0.05)

Use 95% Chebyshev (Mean, Sd) UCL

115.3642

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.434883
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	72.45548

Gamma Distribution Test	
A-D Test Statistic	3.256944
A-D 5% Critical Value	0.769235
K-S Test Statistic	0.381882
K-S 5% Critical Value	0.190465
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	66.44232
Adjusted Gamma UCL	68.51009

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.779118
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	57.59208
95% Chebyshev (MVUE) UCL	68.00412
97.5% Chebyshev (MVUE) UCL	81.66386
99% Chebyshev (MVUE) UCL	108.4958

95% Non-parametric UCLs	
CLT UCL	71.22117
Adj-CLT UCL (Adjusted for skewness)	85.19401
Mod-t UCL (Adjusted for skewness)	74.63496
Jackknife UCL	72.45548
Standard Bootstrap UCL	71.40689
Bootstrap-t UCL	137.7806
Hall's Bootstrap UCL	148.0373
Percentile Bootstrap UCL	74.3
BCA Bootstrap UCL	92.88636
95% Chebyshev (Mean, Sd) UCL	115.3642
97.5% Chebyshev (Mean, Sd) UCL	146.041
99% Chebyshev (Mean, Sd) UCL	206.2996

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: DIELDRIN

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	7
Minimum	0.00025
Maximum	0.05
Mean	0.005777
Median	0.0025
Standard Deviation	0.011057
Variance	1.22E-04
Coefficient of Variation	1.913835
Skewness	3.593843

Gamma Statistics	
k hat	0.863982
k star (bias corrected)	0.776469
Theta hat	0.006687
Theta star	0.00744
nu hat	38.01519
nu star	34.16463
Approx.Chi Square Value (.05)	21.79383
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	21.05629

Log-transformed Statistics	
Minimum of log data	-8.29405
Maximum of log data	-2.995732
Mean of log data	-5.833949
Standard Deviation of log data	0.994679
Variance of log data	0.989387

RECOMMENDATION

Data are Non-parametric (0.05)

Use 95% Chebyshev (Mean, Sd) UCL

0.016053

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.396338
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.009834

Gamma Distribution Test	
A-D Test Statistic	4.81122
A-D 5% Critical Value	0.777421
K-S Test Statistic	0.483004
K-S 5% Critical Value	0.1918
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.009057
Adjusted Gamma UCL	0.009374

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.65308
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.008335
95% Chebyshev (MVUE) UCL	0.009488
97.5% Chebyshev (MVUE) UCL	0.011581
99% Chebyshev (MVUE) UCL	0.015693

95% Non-parametric UCLs	
CLT UCL	0.009655
Adj-CLT UCL (Adjusted for skewness)	0.011585
Mod-t UCL (Adjusted for skewness)	0.010135
Jackknife UCL	0.009834
Standard Bootstrap UCL	0.009564
Bootstrap-t UCL	0.032137
Hall's Bootstrap UCL	0.030644
Percentile Bootstrap UCL	0.01023
BCA Bootstrap UCL	0.009327
95% Chebyshev (Mean, Sd) UCL	0.016053
97.5% Chebyshev (Mean, Sd) UCL	0.020499
99% Chebyshev (Mean, Sd) UCL	0.029232

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: IRON

Raw Statistics

Number of Valid Samples	2
Number of Unique Samples	2
Minimum	22100
Maximum	23200
Mean	22650
Median	22650

Too Few Observations To Calculate UCLs

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: LEAD

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	20
Minimum	5
Maximum	100
Mean	32.15
Median	23.75
Standard Deviation	25.99232
Variance	675.6007
Coefficient of Variation	0.80847
Skewness	1.130055

Gamma Statistics	
k hat	1.597616
k star (bias corrected)	1.410062
Theta hat	20.12374
Theta star	22.80041
nu hat	70.2951
nu star	62.04273
Approx.Chi Square Value (.05)	44.92225
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	43.83468

Log-transformed Statistics	
Minimum of log data	1.609438
Maximum of log data	4.60517
Mean of log data	3.125899
Standard Deviation of log data	0.899671
Variance of log data	0.809408

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

44.40281

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.882872
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	41.68564

Gamma Distribution Test	
A-D Test Statistic	0.252658
A-D 5% Critical Value	0.758184
K-S Test Statistic	0.104438
K-S 5% Critical Value	0.188409
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	44.40281
Adjusted Gamma UCL	45.50447

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.95838
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	54.90401
95% Chebyshev (MVUE) UCL	64.16449
97.5% Chebyshev (MVUE) UCL	77.51359
99% Chebyshev (MVUE) UCL	103.7353

95% Non-parametric UCLs	
CLT UCL	41.26509
Adj-CLT UCL (Adjusted for skewness)	42.69169
Mod-t UCL (Adjusted for skewness)	41.90816
Jackknife UCL	41.68564
Standard Bootstrap UCL	40.9581
Bootstrap-t UCL	43.89042
Hall's Bootstrap UCL	44.04345
Percentile Bootstrap UCL	41.37273
BCA Bootstrap UCL	45.78636
95% Chebyshev (Mean, Sd) UCL	56.30519
97.5% Chebyshev (Mean, Sd) UCL	66.75716
99% Chebyshev (Mean, Sd) UCL	87.28804

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Ja Variable: NAPHTHALENE

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	11
Minimum	0.045
Maximum	4
Mean	0.753864
Median	0.1
Standard Deviation	1.226653
Variance	1.504678
Coefficient of Variation	1.627155
Skewness	1.684721

Gamma Statistics	
k hat	0.468026
k star (bias corrected)	0.434508
Theta hat	1.610729
Theta star	1.734983
nu hat	20.59316
nu star	19.11834
Approx.Chi Square Value (.05)	10.2024
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	9.717271

Log-transformed Statistics	
Minimum of log data	-3.101093
Maximum of log data	1.386294
Mean of log data	-1.653775
Standard Deviation of log data	1.65019
Variance of log data	2.723127

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

3.355988

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.639933
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.203878

Gamma Distribution Test	
A-D Test Statistic	2.644696
A-D 5% Critical Value	0.81118
K-S Test Statistic	0.318178
K-S 5% Critical Value	0.196713
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.412669
Adjusted Gamma UCL	1.483196

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.780313
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2.659183
95% Chebyshev (MVUE) UCL	1.900131
97.5% Chebyshev (MVUE) UCL	2.437704
99% Chebyshev (MVUE) UCL	3.493663

95% Non-parametric UCLs	
CLT UCL	1.184031
Adj-CLT UCL (Adjusted for skewness)	1.284402
Mod-t UCL (Adjusted for skewness)	1.219534
Jackknife UCL	1.203878
Standard Bootstrap UCL	1.178867
Bootstrap-t UCL	1.399961
Hall's Bootstrap UCL	1.220794
Percentile Bootstrap UCL	1.199318
BCA Bootstrap UCL	1.110909
95% Chebyshev (Mean, Sd) UCL	1.893818
97.5% Chebyshev (Mean, Sd) UCL	2.387077
99% Chebyshev (Mean, Sd) UCL	3.355988

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: PCB-1254 (AROCLOR 1254)

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	5
Minimum	0.005
Maximum	0.5
Mean	0.030205
Median	0.005
Standard Deviation	0.105
Variance	0.011025
Coefficient of Variation	3.476293
Skewness	4.680235

Gamma Statistics	
k hat	0.504908
k star (bias corrected)	0.46636
Theta hat	0.059822
Theta star	0.064767
nu hat	22.21595
nu star	20.51984
Approx.Chi Square Value (.05)	11.23373
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	10.72172

Log-transformed Statistics	
Minimum of log data	-5.298317
Maximum of log data	-0.693147
Mean of log data	-4.755875
Standard Deviation of log data	1.003908
Variance of log data	1.00783

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

0.252943

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.245503
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.068725

Gamma Distribution Test	
A-D Test Statistic	5.690499
A-D 5% Critical Value	0.803832
K-S Test Statistic	0.430817
K-S 5% Critical Value	0.195807
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.055172
Adjusted Gamma UCL	0.057807

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.547065
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.024917
95% Chebyshev (MVUE) UCL	0.028277
97.5% Chebyshev (MVUE) UCL	0.034549
99% Chebyshev (MVUE) UCL	0.04687

95% Non-parametric UCLs	
CLT UCL	0.067026
Adj-CLT UCL (Adjusted for skewness)	0.090894
Mod-t UCL (Adjusted for skewness)	0.072448
Jackknife UCL	0.068725
Standard Bootstrap UCL	0.066733
Bootstrap-t UCL	0.780955
Hall's Bootstrap UCL	0.363165
Percentile Bootstrap UCL	0.074773
BCA Bootstrap UCL	0.097795
95% Chebyshev (Mean, Sd) UCL	0.127783
97.5% Chebyshev (Mean, Sd) UCL	0.170005
99% Chebyshev (Mean, Sd) UCL	0.252943

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: PHENANTHRENE

Raw Statistics	
Number of Valid Samples	20
Number of Unique Samples	10
Minimum	0.013
Maximum	4
Mean	0.74915
Median	0.05
Standard Deviation	1.284894
Variance	1.650953
Coefficient of Variation	1.715136
Skewness	1.643178

Gamma Statistics	
k hat	0.40085
k star (bias corrected)	0.374056
Theta hat	1.868905
Theta star	2.002777
nu hat	16.03399
nu star	14.96223
Approx.Chi Square Value (.05)	7.234092
Adjusted Level of Significance	0.038
Adjusted Chi Square Value	6.811745

Log-transformed Statistics	
Minimum of log data	-4.342806
Maximum of log data	1.386294
Mean of log data	-1.929861
Standard Deviation of log data	1.813847
Variance of log data	3.29004

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

3.607859

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.616766
Shapiro-Wilk 5% Critical Value	0.905
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.245949

Gamma Distribution Test	
A-D Test Statistic	2.770018
A-D 5% Critical Value	0.823441
K-S Test Statistic	0.356713
K-S 5% Critical Value	0.207498
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.549462
Adjusted Gamma UCL	1.645533

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.787802
Shapiro-Wilk 5% Critical Value	0.905
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3.79319
95% Chebyshev (MVUE) UCL	1.985954
97.5% Chebyshev (MVUE) UCL	2.573833
99% Chebyshev (MVUE) UCL	3.728609

95% Non-parametric UCLs	
CLT UCL	1.221735
Adj-CLT UCL (Adjusted for skewness)	1.334533
Mod-t UCL (Adjusted for skewness)	1.263543
Jackknife UCL	1.245949
Standard Bootstrap UCL	1.209456
Bootstrap-t UCL	1.462784
Hall's Bootstrap UCL	1.25754
Percentile Bootstrap UCL	1.2154
BCA Bootstrap UCL	1.55425
95% Chebyshev (Mean, Sd) UCL	2.00151
97.5% Chebyshev (Mean, Sd) UCL	2.543407
99% Chebyshev (Mean, Sd) UCL	3.607859

A-1.2 Surface and Subsurface Soil 0-30 feet

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: 1,1,1-TRICHLOROETHANE

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	33
Minimum	0.000415
Maximum	1200
Mean	33.58774
Median	0.0485
Standard Deviation	188.391
Variance	35491.17
Coefficient of Variation	5.608921
Skewness	5.708425

Gamma Statistics	
k hat	0.119444
k star (bias corrected)	0.124116
Theta hat	281.2009
Theta star	270.6165
nu hat	15.7666
nu star	16.38327
Approx.Chi Square Value (.05)	8.231969
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	8.1026

Log-transformed Statistics	
Minimum of log data	-7.787232
Maximum of log data	7.090077
Mean of log data	-3.129291
Standard Deviation of log data	3.349014
Variance of log data	11.2159

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

264.3187

Normal Distribution Test	
Lilliefors Test Statisitic	0.508995
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	72.28229

Gamma Distribution Test	
A-D Test Statistic	11.67595
A-D 5% Critical Value	0.973389
K-S Test Statistic	0.372342
K-S 5% Critical Value	0.124606
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	66.84635
Adjusted Gamma UCL	67.91364

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.153171
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	104.3711
95% Chebyshev (MVUE) UCL	30.61232
97.5% Chebyshev (MVUE) UCL	40.61522
99% Chebyshev (MVUE) UCL	60.26397

95% Non-parametric UCLs	
CLT UCL	71.7308
Adj-CLT UCL (Adjusted for skewness)	89.14136
Mod-t UCL (Adjusted for skewness)	74.99798
Jackknife UCL	72.28229
Standard Bootstrap UCL	72.02589
Bootstrap-t UCL	3013.517
Hall's Bootstrap UCL	2391.789
Percentile Bootstrap UCL	77.38499
BCA Bootstrap UCL	110.2372
95% Chebyshev (Mean, Sd) UCL	134.6677
97.5% Chebyshev (Mean, Sd) UCL	178.4051
99% Chebyshev (Mean, Sd) UCL	264.3187

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\L Variable: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	30
Minimum	0.0025
Maximum	590
Mean	16.80846
Median	0.144
Standard Deviation	88.49909
Variance	7832.089
Coefficient of Variation	5.265152
Skewness	5.805307

Gamma Statistics	
k hat	0.147079
k star (bias corrected)	0.150494
Theta hat	114.2822
Theta star	111.6884
nu hat	19.41437
nu star	19.86523
Approx.Chi Square Value (.05)	10.75036
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	10.60023

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	6.380123
Mean of log data	-2.418682
Standard Deviation of log data	2.904959
Variance of log data	8.438785

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

125.1973

Normal Distribution Test	
Lilliefors Test Statisitic	0.495128
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	34.98572

Gamma Distribution Test	
A-D Test Statistic	11.69724
A-D 5% Critical Value	0.95156
K-S Test Statistic	0.427759
K-S 5% Critical Value	0.123582
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	31.05978
Adjusted Gamma UCL	31.49969

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.19344
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	31.50705
95% Chebyshev (MVUE) UCL	16.51981
97.5% Chebyshev (MVUE) UCL	21.70304
99% Chebyshev (MVUE) UCL	31.8845

95% Non-parametric UCLs	
CLT UCL	34.72665
Adj-CLT UCL (Adjusted for skewness)	43.04429
Mod-t UCL (Adjusted for skewness)	36.2831
Jackknife UCL	34.98572
Standard Bootstrap UCL	34.31698
Bootstrap-t UCL	245.1938
Hall's Bootstrap UCL	289.1124
Percentile Bootstrap UCL	34.9989
BCA Bootstrap UCL	50.67923
95% Chebyshev (Mean, Sd) UCL	64.29206
97.5% Chebyshev (Mean, Sd) UCL	84.83825
99% Chebyshev (Mean, Sd) UCL	125.1973

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: 1,1-DICHLOROETHENE

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	28
Minimum	0.0019
Maximum	60
Mean	2.088383
Median	0.1475
Standard Deviation	8.605962
Variance	74.06257
Coefficient of Variation	4.120874
Skewness	5.475862

Gamma Statistics	
k hat	0.208855
k star (bias corrected)	0.209463
Theta hat	9.9992
Theta star	9.970195
nu hat	27.56885
nu star	27.64906
Approx.Chi Square Value (.05)	16.65319
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	16.46225

Log-transformed Statistics	
Minimum of log data	-6.265901
Maximum of log data	4.094345
Mean of log data	-2.763382
Standard Deviation of log data	2.551359
Variance of log data	6.509435

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

12.62849

Normal Distribution Test	
Lilliefors Test Statisitic	0.497458
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	3.856003

Gamma Distribution Test	
A-D Test Statistic	8.765381
A-D 5% Critical Value	0.905768
K-S Test Statistic	0.405927
K-S 5% Critical Value	0.121405
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.467313
Adjusted Gamma UCL	3.507529

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.203777
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	6.095129
95% Chebyshev (MVUE) UCL	4.406648
97.5% Chebyshev (MVUE) UCL	5.726417
99% Chebyshev (MVUE) UCL	8.318849

95% Non-parametric UCLs	
CLT UCL	3.83081
Adj-CLT UCL (Adjusted for skewness)	4.593746
Mod-t UCL (Adjusted for skewness)	3.975005
Jackknife UCL	3.856003
Standard Bootstrap UCL	3.78884
Bootstrap-t UCL	6.41719
Hall's Bootstrap UCL	5.059547
Percentile Bootstrap UCL	3.885054
BCA Bootstrap UCL	5.330551
95% Chebyshev (Mean, Sd) UCL	6.705854
97.5% Chebyshev (Mean, Sd) UCL	8.703838
99% Chebyshev (Mean, Sd) UCL	12.62849

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: 1,2-DICHLOROETHANE

Raw Statistics	
Number of Valid Samples	65
Number of Unique Samples	24
Minimum	0.000415
Maximum	25
Mean	1.598884
Median	0.05
Standard Deviation	5.53947
Variance	30.68573
Coefficient of Variation	3.464586
Skewness	3.859455

Gamma Statistics	
k hat	0.193992
k star (bias corrected)	0.195295
Theta hat	8.242014
Theta star	8.187026
nu hat	25.21894
nu star	25.38833
Approx.Chi Square Value (.05)	14.90742
Adjusted Level of Significance	0.046308
Adjusted Chi Square Value	14.72483

Log-transformed Statistics	
Minimum of log data	-7.787232
Maximum of log data	3.218876
Mean of log data	-3.342291
Standard Deviation of log data	3.054371
Variance of log data	9.329184

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

8.43531

Normal Distribution Test	
Lilliefors Test Statisitic	0.4885
Lilliefors 5% Critical Value	0.109895
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.74564

Gamma Distribution Test	
A-D Test Statistic	6.434176
A-D 5% Critical Value	0.914485
K-S Test Statistic	0.343162
K-S 5% Critical Value	0.122767
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.723006
Adjusted Gamma UCL	2.75677

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.20058
Lilliefors 5% Critical Value	0.109895
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	23.00954
95% Chebyshev (MVUE) UCL	10.11344
97.5% Chebyshev (MVUE) UCL	13.33963
99% Chebyshev (MVUE) UCL	19.67684

95% Non-parametric UCLs	
CLT UCL	2.729041
Adj-CLT UCL (Adjusted for skewness)	3.080489
Mod-t UCL (Adjusted for skewness)	2.800459
Jackknife UCL	2.74564
Standard Bootstrap UCL	2.715085
Bootstrap-t UCL	3.533788
Hall's Bootstrap UCL	2.55046
Percentile Bootstrap UCL	2.871723
BCA Bootstrap UCL	3.484869
95% Chebyshev (Mean, Sd) UCL	4.593825
97.5% Chebyshev (Mean, Sd) UCL	5.889739
99% Chebyshev (Mean, Sd) UCL	8.43531

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: 1,4-DIOXANE

Raw Statistics	
Number of Valid Samples	38
Number of Unique Samples	19
Minimum	0.0125
Maximum	41
Mean	2.687487
Median	0.093
Standard Deviation	8.216305
Variance	67.50767
Coefficient of Variation	3.057245
Skewness	3.793659

Gamma Statistics	
k hat	0.237036
k star (bias corrected)	0.235867
Theta hat	11.33788
Theta star	11.3941
nu hat	18.01474
nu star	17.92586
Approx.Chi Square Value (.05)	9.335935
Adjusted Level of Significance	0.0434
Adjusted Chi Square Value	9.078559

Log-transformed Statistics	
Minimum of log data	-4.382027
Maximum of log data	3.713572
Mean of log data	-2.033705
Standard Deviation of log data	2.25343
Variance of log data	5.077946

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

15.94928

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.381188
Shapiro-Wilk 5% Critical Value	0.938
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	4.936147

Gamma Distribution Test	
A-D Test Statistic	5.436967
A-D 5% Critical Value	0.885092
K-S Test Statistic	0.357895
K-S 5% Critical Value	0.157362
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	5.160224
Adjusted Gamma UCL	5.306515

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.831919
Shapiro-Wilk 5% Critical Value	0.938
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	7.538395
95% Chebyshev (MVUE) UCL	4.451912
97.5% Chebyshev (MVUE) UCL	5.792685
99% Chebyshev (MVUE) UCL	8.426374

95% Non-parametric UCLs	
CLT UCL	4.879848
Adj-CLT UCL (Adjusted for skewness)	5.756307
Mod-t UCL (Adjusted for skewness)	5.072857
Jackknife UCL	4.936147
Standard Bootstrap UCL	4.853265
Bootstrap-t UCL	8.355232
Hall's Bootstrap UCL	11.0263
Percentile Bootstrap UCL	5.085395
BCA Bootstrap UCL	6.786211
95% Chebyshev (Mean, Sd) UCL	8.497292
97.5% Chebyshev (Mean, Sd) UCL	11.0112
99% Chebyshev (Mean, Sd) UCL	15.94928

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: 2-METHYLNAPHTHALENE

Raw Statistics	
Number of Valid Samples	43
Number of Unique Samples	14
Minimum	0.045
Maximum	4
Mean	0.449302
Median	0.1
Standard Deviation	0.915765
Variance	0.838626
Coefficient of Variation	2.038194
Skewness	2.851316

Gamma Statistics	
k hat	0.582135
k star (bias corrected)	0.557025
Theta hat	0.771818
Theta star	0.806611
nu hat	50.06361
nu star	47.90413
Approx.Chi Square Value (.05)	33.01571
Adjusted Level of Significance	0.044419
Adjusted Chi Square Value	32.58561

Log-transformed Statistics	
Minimum of log data	-3.101093
Maximum of log data	1.386294
Mean of log data	-1.866223
Standard Deviation of log data	1.232312
Variance of log data	1.518594

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

1.838831

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.482957
Shapiro-Wilk 5% Critical Value	0.943
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.684192

Gamma Distribution Test	
A-D Test Statistic	6.342937
A-D 5% Critical Value	0.805468
K-S Test Statistic	0.348743
K-S 5% Critical Value	0.141816
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.651915
Adjusted Gamma UCL	0.66052

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.772164
Shapiro-Wilk 5% Critical Value	0.943
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.544145
95% Chebyshev (MVUE) UCL	0.645612
97.5% Chebyshev (MVUE) UCL	0.786108
99% Chebyshev (MVUE) UCL	1.062085

95% Non-parametric UCLs	
CLT UCL	0.679011
Adj-CLT UCL (Adjusted for skewness)	0.743895
Mod-t UCL (Adjusted for skewness)	0.694312
Jackknife UCL	0.684192
Standard Bootstrap UCL	0.671245
Bootstrap-t UCL	0.82647
Hall's Bootstrap UCL	0.723052
Percentile Bootstrap UCL	0.697093
BCA Bootstrap UCL	0.660233
95% Chebyshev (Mean, Sd) UCL	1.058035
97.5% Chebyshev (Mean, Sd) UCL	1.321434
99% Chebyshev (Mean, Sd) UCL	1.838831

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: BENZO(A)ANTHRACENE

Raw Statistics	
Number of Valid Samples	40
Number of Unique Samples	11
Minimum	0.032
Maximum	4
Mean	0.50555
Median	0.1
Standard Deviation	0.997842
Variance	0.995688
Coefficient of Variation	1.973775
Skewness	2.405488

Gamma Statistics	
k hat	0.517252
k star (bias corrected)	0.495125
Theta hat	0.977376
Theta star	1.021055
nu hat	41.38019
nu star	39.61
Approx.Chi Square Value (.05)	26.18927
Adjusted Level of Significance	0.044
Adjusted Chi Square Value	25.77946

Log-transformed Statistics	
Minimum of log data	-3.442019
Maximum of log data	1.386294
Mean of log data	-1.903681
Standard Deviation of log data	1.347857
Variance of log data	1.816718

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

2.075368

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.512152
Shapiro-Wilk 5% Critical Value	0.94
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.771377

Gamma Distribution Test	
A-D Test Statistic	6.630065
A-D 5% Critical Value	0.811462
K-S Test Statistic	0.414986
K-S 5% Critical Value	0.147379
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.76462
Adjusted Gamma UCL	0.776775

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.741309
Shapiro-Wilk 5% Critical Value	0.94
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.674838
95% Chebyshev (MVUE) UCL	0.770414
97.5% Chebyshev (MVUE) UCL	0.950247
99% Chebyshev (MVUE) UCL	1.303496

95% Non-parametric UCLs	
CLT UCL	0.765063
Adj-CLT UCL (Adjusted for skewness)	0.829182
Mod-t UCL (Adjusted for skewness)	0.781378
Jackknife UCL	0.771377
Standard Bootstrap UCL	0.759355
Bootstrap-t UCL	0.86927
Hall's Bootstrap UCL	0.787641
Percentile Bootstrap UCL	0.7818
BCA Bootstrap UCL	0.90555
95% Chebyshev (Mean, Sd) UCL	1.193265
97.5% Chebyshev (Mean, Sd) UCL	1.49084
99% Chebyshev (Mean, Sd) UCL	2.075368

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: BENZO(A)PYRENE

Raw Statistics	
Number of Valid Samples	40
Number of Unique Samples	10
Minimum	0.045
Maximum	4
Mean	0.486
Median	0.1
Standard Deviation	0.966207
Variance	0.933557
Coefficient of Variation	1.988081
Skewness	2.549616

Gamma Statistics	
k hat	0.532581
k star (bias corrected)	0.509304
Theta hat	0.912537
Theta star	0.954243
nu hat	42.60647
nu star	40.74432
Approx.Chi Square Value (.05)	27.11426
Adjusted Level of Significance	0.044
Adjusted Chi Square Value	26.69674

Log-transformed Statistics	
Minimum of log data	-3.101093
Maximum of log data	1.386294
Mean of log data	-1.90266
Standard Deviation of log data	1.316452
Variance of log data	1.733045

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

2.00605

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.508241
Shapiro-Wilk 5% Critical Value	0.94
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.7434

Gamma Distribution Test	
A-D Test Statistic	6.640217
A-D 5% Critical Value	0.80999
K-S Test Statistic	0.415799
K-S 5% Critical Value	0.147219
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.730307
Adjusted Gamma UCL	0.741729

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.727297
Shapiro-Wilk 5% Critical Value	0.94
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.633469
95% Chebyshev (MVUE) UCL	0.729596
97.5% Chebyshev (MVUE) UCL	0.897518
99% Chebyshev (MVUE) UCL	1.227368

95% Non-parametric UCLs	
CLT UCL	0.737286
Adj-CLT UCL (Adjusted for skewness)	0.803092
Mod-t UCL (Adjusted for skewness)	0.753664
Jackknife UCL	0.7434
Standard Bootstrap UCL	0.740412
Bootstrap-t UCL	0.865461
Hall's Bootstrap UCL	0.769336
Percentile Bootstrap UCL	0.743625
BCA Bootstrap UCL	0.6985
95% Chebyshev (Mean, Sd) UCL	1.151912
97.5% Chebyshev (Mean, Sd) UCL	1.440053
99% Chebyshev (Mean, Sd) UCL	2.00605

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: BENZO(B)FLUORANTHENE

Raw Statistics	
Number of Valid Samples	40
Number of Unique Samples	10
Minimum	0.045
Maximum	4
Mean	0.46875
Median	0.1
Standard Deviation	0.951862
Variance	0.906041
Coefficient of Variation	2.030638
Skewness	2.682994

Gamma Statistics	
k hat	0.541354
k star (bias corrected)	0.517419
Theta hat	0.865884
Theta star	0.905938
nu hat	43.30833
nu star	41.39354
Approx.Chi Square Value (.05)	27.64499
Adjusted Level of Significance	0.044
Adjusted Chi Square Value	27.22311

Log-transformed Statistics	
Minimum of log data	-3.101093
Maximum of log data	1.386294
Mean of log data	-1.916768
Standard Deviation of log data	1.293191
Variance of log data	1.672344

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

1.966231

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.495653
Shapiro-Wilk 5% Critical Value	0.94
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.722328

Gamma Distribution Test	
A-D Test Statistic	6.539496
A-D 5% Critical Value	0.809147
K-S Test Statistic	0.413797
K-S 5% Critical Value	0.147127
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.701871
Adjusted Gamma UCL	0.712748

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.733319
Shapiro-Wilk 5% Critical Value	0.94
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.59612
95% Chebyshev (MVUE) UCL	0.690755
97.5% Chebyshev (MVUE) UCL	0.848031
99% Chebyshev (MVUE) UCL	1.156971

95% Non-parametric UCLs	
CLT UCL	0.716305
Adj-CLT UCL (Adjusted for skewness)	0.784525
Mod-t UCL (Adjusted for skewness)	0.732969
Jackknife UCL	0.722328
Standard Bootstrap UCL	0.715192
Bootstrap-t UCL	0.902814
Hall's Bootstrap UCL	0.761713
Percentile Bootstrap UCL	0.742625
BCA Bootstrap UCL	0.701125
95% Chebyshev (Mean, Sd) UCL	1.124775
97.5% Chebyshev (Mean, Sd) UCL	1.408638
99% Chebyshev (Mean, Sd) UCL	1.966231

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\l Variable: BIS(2-ETHYLHEXYL)PHTHALATE

Raw Statistics	
Number of Valid Samples	41
Number of Unique Samples	20
Minimum	0.03
Maximum	51
Mean	2.715293
Median	0.2
Standard Deviation	8.108402
Variance	65.74619
Coefficient of Variation	2.986198
Skewness	5.56684

Gamma Statistics	
k hat	0.381893
k star (bias corrected)	0.37021
Theta hat	7.110091
Theta star	7.334474
nu hat	31.31521
nu star	30.35719
Approx.Chi Square Value (.05)	18.77181
Adjusted Level of Significance	0.044146
Adjusted Chi Square Value	18.43821

Log-transformed Statistics	
Minimum of log data	-3.506558
Maximum of log data	3.931826
Mean of log data	-0.737136
Standard Deviation of log data	1.759769
Variance of log data	3.096788

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

15.31501

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.344972
Shapiro-Wilk 5% Critical Value	0.941
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	4.847586

Gamma Distribution Test	
A-D Test Statistic	3.793438
A-D 5% Critical Value	0.839958
K-S Test Statistic	0.299756
K-S 5% Critical Value	0.148206
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	4.391087
Adjusted Gamma UCL	4.470534

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.886997
Shapiro-Wilk 5% Critical Value	0.941
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5.688145
95% Chebyshev (MVUE) UCL	5.441398
97.5% Chebyshev (MVUE) UCL	6.903742
99% Chebyshev (MVUE) UCL	9.776231

95% Non-parametric UCLs	
CLT UCL	4.798203
Adj-CLT UCL (Adjusted for skewness)	5.974564
Mod-t UCL (Adjusted for skewness)	5.031075
Jackknife UCL	4.847586
Standard Bootstrap UCL	4.707702
Bootstrap-t UCL	9.556824
Hall's Bootstrap UCL	11.78957
Percentile Bootstrap UCL	5.098293
BCA Bootstrap UCL	4.959439
95% Chebyshev (Mean, Sd) UCL	8.235052
97.5% Chebyshev (Mean, Sd) UCL	10.62346
99% Chebyshev (Mean, Sd) UCL	15.31501

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: CHROMIUM

Raw Statistics	
Number of Valid Samples	44
Number of Unique Samples	29
Minimum	5.6
Maximum	360
Mean	36.88864
Median	20
Standard Deviation	61.37268
Variance	3766.606
Coefficient of Variation	1.663729
Skewness	4.191398

Gamma Statistics	
k hat	1.183957
k star (bias corrected)	1.118384
Theta hat	31.15707
Theta star	32.98387
nu hat	104.1882
nu star	98.41781
Approx.Chi Square Value (.05)	76.52823
Adjusted Level of Significance	0.044545
Adjusted Chi Square Value	75.87396

Log-transformed Statistics	
Minimum of log data	1.722767
Maximum of log data	5.886104
Mean of log data	3.129476
Standard Deviation of log data	0.797675
Variance of log data	0.636286

RECOMMENDATION

Data are Non-parametric (0.05)

Use 95% Chebyshev (Mean, Sd) UCL

77.21839

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.438479
Shapiro-Wilk 5% Critical Value	0.944
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	52.44237

Gamma Distribution Test	
A-D Test Statistic	5.124401
A-D 5% Critical Value	0.77364
K-S Test Statistic	0.325005
K-S 5% Critical Value	0.136691
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	47.44
Adjusted Gamma UCL	47.84907

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.844926
Shapiro-Wilk 5% Critical Value	0.944
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	40.77602
95% Chebyshev (MVUE) UCL	49.3415
97.5% Chebyshev (MVUE) UCL	57.22021
99% Chebyshev (MVUE) UCL	72.6964

95% Non-parametric UCLs	
CLT UCL	52.10728
Adj-CLT UCL (Adjusted for skewness)	58.35414
Mod-t UCL (Adjusted for skewness)	53.41675
Jackknife UCL	52.44237
Standard Bootstrap UCL	51.62959
Bootstrap-t UCL	78.04219
Hall's Bootstrap UCL	104.7919
Percentile Bootstrap UCL	52.98409
BCA Bootstrap UCL	63.21136
95% Chebyshev (Mean, Sd) UCL	77.21839
97.5% Chebyshev (Mean, Sd) UCL	94.6691
99% Chebyshev (Mean, Sd) UCL	128.9477

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: DIELDRIN

Raw Statistics	
Number of Valid Samples	43
Number of Unique Samples	11
Minimum	0.00025
Maximum	0.1025
Mean	0.006762
Median	0.00175
Standard Deviation	0.018647
Variance	0.000348
Coefficient of Variation	2.757792
Skewness	4.057412

Gamma Statistics	
k hat	0.417622
k star (bias corrected)	0.40399
Theta hat	0.016191
Theta star	0.016737
nu hat	35.91553
nu star	34.74313
Approx.Chi Square Value (.05)	22.25694
Adjusted Level of Significance	0.044419
Adjusted Chi Square Value	21.90886

Log-transformed Statistics	
Minimum of log data	-8.29405
Maximum of log data	-2.277892
Mean of log data	-6.561289
Standard Deviation of log data	1.520684
Variance of log data	2.312479

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

0.035056

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.383022
Shapiro-Wilk 5% Critical Value	0.943
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.011545

Gamma Distribution Test	
A-D Test Statistic	5.811941
A-D 5% Critical Value	0.832625
K-S Test Statistic	0.389178
K-S 5% Critical Value	0.144218
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.010555
Adjusted Gamma UCL	0.010723

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.802981
Shapiro-Wilk 5% Critical Value	0.943
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.009056
95% Chebyshev (MVUE) UCL	0.009919
97.5% Chebyshev (MVUE) UCL	0.012368
99% Chebyshev (MVUE) UCL	0.01718

95% Non-parametric UCLs	
CLT UCL	0.011439
Adj-CLT UCL (Adjusted for skewness)	0.013319
Mod-t UCL (Adjusted for skewness)	0.011838
Jackknife UCL	0.011545
Standard Bootstrap UCL	0.011387
Bootstrap-t UCL	0.017823
Hall's Bootstrap UCL	0.013327
Percentile Bootstrap UCL	0.011542
BCA Bootstrap UCL	0.015363
95% Chebyshev (Mean, Sd) UCL	0.019157
97.5% Chebyshev (Mean, Sd) UCL	0.02452
99% Chebyshev (Mean, Sd) UCL	0.035056

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: IRON

Raw Statistics	
Number of Valid Samples	4
Number of Unique Samples	4
Minimum	22100
Maximum	23300
Mean	22925
Median	23150
Standard Deviation	556.0276
Variance	309166.7
Coefficient of Variation	0.024254
Skewness	-1.871671

Gamma Statistics	
k hat	2231.793
k star (bias corrected)	558.115
Theta hat	10.27201
Theta star	41.07577
nu hat	17854.35
nu star	4464.92
Approx.Chi Square Value (.05)	4310.597
Adjusted Level of Significance	N/A
Adjusted Chi Square Value	N/A

Log-transformed Statistics	
Minimum of log data	10.00333
Maximum of log data	10.05621
Mean of log data	10.03976
Standard Deviation of log data	0.024538
Variance of log data	0.000602

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

23579.27

Recommended UCL exceeds the maximum observation

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.763311
Shapiro-Wilk 5% Critical Value	0.748

Data are normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	23579.27

Gamma Distribution Test	
A-D Test Statistic	0.655699
A-D 5% Critical Value	0.65652
K-S Test Statistic	0.393102
K-S 5% Critical Value	0.39399

Data follow gamma distribution at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	23745.73
Adjusted Gamma UCL	N/A

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.760375
Shapiro-Wilk 5% Critical Value	0.748

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	N/A
95% Chebyshev (MVUE) UCL	24151
97.5% Chebyshev (MVUE) UCL	24681.47
99% Chebyshev (MVUE) UCL	25723.48

95% Non-parametric UCLs	
CLT UCL	23382.29
Adj-CLT UCL (Adjusted for skewness)	23104.29
Mod-t UCL (Adjusted for skewness)	23535.9
Jackknife UCL	23579.27
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	24136.83
97.5% Chebyshev (Mean, Sd) UCL	24661.2
99% Chebyshev (Mean, Sd) UCL	25691.2

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\L Variable: LEAD

Raw Statistics	
Number of Valid Samples	44
Number of Unique Samples	35
Minimum	2.5
Maximum	890
Mean	48.11364
Median	21.5
Standard Deviation	132.1394
Variance	17460.82
Coefficient of Variation	2.746402
Skewness	6.292421

Gamma Statistics	
k hat	0.774439
k star (bias corrected)	0.736788
Theta hat	62.12711
Theta star	65.30191
nu hat	68.1506
nu star	64.83731
Approx.Chi Square Value (.05)	47.30719
Adjusted Level of Significance	0.044545
Adjusted Chi Square Value	46.79898

Log-transformed Statistics	
Minimum of log data	0.916291
Maximum of log data	6.791221
Mean of log data	3.103905
Standard Deviation of log data	1.013958
Variance of log data	1.028111

RECOMMENDATION

Data are lognormal (0.05)

Use H-UCL

53.68825

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.284334
Shapiro-Wilk 5% Critical Value	0.944
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	81.60184

Gamma Distribution Test	
A-D Test Statistic	3.093067
A-D 5% Critical Value	0.788374
K-S Test Statistic	0.219374
K-S 5% Critical Value	0.138479
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	65.9426
Adjusted Gamma UCL	66.65869

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.957803
Shapiro-Wilk 5% Critical Value	0.944
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	53.68825
95% Chebyshev (MVUE) UCL	65.28727
97.5% Chebyshev (MVUE) UCL	77.68799
99% Chebyshev (MVUE) UCL	102.0468

95% Non-parametric UCLs	
CLT UCL	80.88037
Adj-CLT UCL (Adjusted for skewness)	101.0723
Mod-t UCL (Adjusted for skewness)	84.75137
Jackknife UCL	81.60184
Standard Bootstrap UCL	79.8474
Bootstrap-t UCL	200.7991
Hall's Bootstrap UCL	200.1176
Percentile Bootstrap UCL	85.99318
BCA Bootstrap UCL	128.0841
95% Chebyshev (Mean, Sd) UCL	134.9462
97.5% Chebyshev (Mean, Sd) UCL	172.5188
99% Chebyshev (Mean, Sd) UCL	246.3227

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: METHYLENE CHLORIDE

Raw Statistics	
Number of Valid Samples	65
Number of Unique Samples	21
Minimum	0.0025
Maximum	100
Mean	3.262622
Median	0.25
Standard Deviation	14.61299
Variance	213.5395
Coefficient of Variation	4.47891
Skewness	5.623369

Gamma Statistics	
k hat	0.177328
k star (bias corrected)	0.1794
Theta hat	18.39884
Theta star	18.18633
nu hat	23.05259
nu star	23.32196
Approx.Chi Square Value (.05)	13.33252
Adjusted Level of Significance	0.046308
Adjusted Chi Square Value	13.16078

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	4.60517
Mean of log data	-3.045153
Standard Deviation of log data	2.801016
Variance of log data	7.845689

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

21.29695

Normal Distribution Test	
Lilliefors Test Statisitic	0.498051
Lilliefors 5% Critical Value	0.109895
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	6.287738

Gamma Distribution Test	
A-D Test Statistic	9.517922
A-D 5% Critical Value	0.927523
K-S Test Statistic	0.357854
K-S 5% Critical Value	0.123384
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	5.707152
Adjusted Gamma UCL	5.781628

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.230846
Lilliefors 5% Critical Value	0.109895
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	11.45375
95% Chebyshev (MVUE) UCL	6.573399
97.5% Chebyshev (MVUE) UCL	8.613529
99% Chebyshev (MVUE) UCL	12.62097

95% Non-parametric UCLs	
CLT UCL	6.243949
Adj-CLT UCL (Adjusted for skewness)	7.594785
Mod-t UCL (Adjusted for skewness)	6.498441
Jackknife UCL	6.287738
Standard Bootstrap UCL	6.255233
Bootstrap-t UCL	15.25427
Hall's Bootstrap UCL	18.44889
Percentile Bootstrap UCL	6.49239
BCA Bootstrap UCL	8.681182
95% Chebyshev (Mean, Sd) UCL	11.16321
97.5% Chebyshev (Mean, Sd) UCL	14.58179
99% Chebyshev (Mean, Sd) UCL	21.29695

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: NAPHTHALENE

Raw Statistics	
Number of Valid Samples	60
Number of Unique Samples	26
Minimum	0.002
Maximum	4
Mean	0.341438
Median	0.1
Standard Deviation	0.804046
Variance	0.64649
Coefficient of Variation	2.354885
Skewness	3.346329

Gamma Statistics	
k hat	0.399911
k star (bias corrected)	0.391026
Theta hat	0.853784
Theta star	0.873183
nu hat	47.98928
nu star	46.92315
Approx.Chi Square Value (.05)	32.20124
Adjusted Level of Significance	0.046
Adjusted Chi Square Value	31.90083

Log-transformed Statistics	
Minimum of log data	-6.214608
Maximum of log data	1.386294
Mean of log data	-2.720111
Standard Deviation of log data	1.911519
Variance of log data	3.653903

RECOMMENDATION

Data are Non-parametric (0.05)

Use 97.5% Chebyshev (Mean, Sd) UCL

0.98968

Normal Distribution Test	
Lilliefors Test Statisitic	0.419817
Lilliefors 5% Critical Value	0.114382
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.5149

Gamma Distribution Test	
A-D Test Statistic	4.364722
A-D 5% Critical Value	0.839641
K-S Test Statistic	0.262376
K-S 5% Critical Value	0.122906
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.497537
Adjusted Gamma UCL	0.502223

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.187677
Lilliefors 5% Critical Value	0.114382
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.941969
95% Chebyshev (MVUE) UCL	0.976295
97.5% Chebyshev (MVUE) UCL	1.235179
99% Chebyshev (MVUE) UCL	1.743706

95% Non-parametric UCLs	
CLT UCL	0.512176
Adj-CLT UCL (Adjusted for skewness)	0.560092
Mod-t UCL (Adjusted for skewness)	0.522374
Jackknife UCL	0.5149
Standard Bootstrap UCL	0.507667
Bootstrap-t UCL	0.632358
Hall's Bootstrap UCL	0.555105
Percentile Bootstrap UCL	0.516774
BCA Bootstrap UCL	0.648994
95% Chebyshev (Mean, Sd) UCL	0.7939
97.5% Chebyshev (Mean, Sd) UCL	0.98968
99% Chebyshev (Mean, Sd) UCL	1.374253

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\l Variable: PCB-1254 (AROCLOR 1254)

Raw Statistics	
Number of Valid Samples	43
Number of Unique Samples	9
Minimum	0.005
Maximum	0.5
Mean	0.028221
Median	0.015
Standard Deviation	0.080006
Variance	0.006401
Coefficient of Variation	2.834998
Skewness	5.401464

Gamma Statistics	
k hat	0.715389
k star (bias corrected)	0.680982
Theta hat	0.039448
Theta star	0.041442
nu hat	61.52341
nu star	58.56441
Approx.Chi Square Value (.05)	41.96699
Adjusted Level of Significance	0.044419
Adjusted Chi Square Value	41.47839

Log-transformed Statistics	
Minimum of log data	-5.298317
Maximum of log data	-0.693147
Mean of log data	-4.40992
Standard Deviation of log data	0.93155
Variance of log data	0.867786

RECOMMENDATION

Data are Non-parametric (0.05)

Use 95% Chebyshev (Mean, Sd) UCL

0.081403

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.288316
Shapiro-Wilk 5% Critical Value	0.943
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.048742

Gamma Distribution Test	
A-D Test Statistic	7.081433
A-D 5% Critical Value	0.792761
K-S Test Statistic	0.39285
K-S 5% Critical Value	0.140528
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.039382
Adjusted Gamma UCL	0.039846

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.743529
Shapiro-Wilk 5% Critical Value	0.943
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.026036
95% Chebyshev (MVUE) UCL	0.031675
97.5% Chebyshev (MVUE) UCL	0.037376
99% Chebyshev (MVUE) UCL	0.048576

95% Non-parametric UCLs	
CLT UCL	0.04829
Adj-CLT UCL (Adjusted for skewness)	0.059028
Mod-t UCL (Adjusted for skewness)	0.050417
Jackknife UCL	0.048742
Standard Bootstrap UCL	0.048128
Bootstrap-t UCL	0.194633
Hall's Bootstrap UCL	0.14228
Percentile Bootstrap UCL	0.051547
BCA Bootstrap UCL	0.067953
95% Chebyshev (Mean, Sd) UCL	0.081403
97.5% Chebyshev (Mean, Sd) UCL	0.104415
99% Chebyshev (Mean, Sd) UCL	0.149618

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: PHENANTHRENE

Raw Statistics	
Number of Valid Samples	41
Number of Unique Samples	12
Minimum	0.013
Maximum	5
Mean	0.556
Median	0.1
Standard Deviation	1.179176
Variance	1.390455
Coefficient of Variation	2.12082
Skewness	2.628345

Gamma Statistics	
k hat	0.461783
k star (bias corrected)	0.444254
Theta hat	1.204028
Theta star	1.251536
nu hat	37.86622
nu star	36.42885
Approx.Chi Square Value (.05)	23.61189
Adjusted Level of Significance	0.044146
Adjusted Chi Square Value	23.2342

Log-transformed Statistics	
Minimum of log data	-4.342806
Maximum of log data	1.609438
Mean of log data	-1.9797
Standard Deviation of log data	1.4675
Variance of log data	2.153556

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

2.388332

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.496187
Shapiro-Wilk 5% Critical Value	0.941
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.866092

Gamma Distribution Test	
A-D Test Statistic	6.23876
A-D 5% Critical Value	0.821845
K-S Test Statistic	0.407377
K-S 5% Critical Value	0.146653
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.857807
Adjusted Gamma UCL	0.871751

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.805988
Shapiro-Wilk 5% Critical Value	0.941
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.801145
95% Chebyshev (MVUE) UCL	0.883877
97.5% Chebyshev (MVUE) UCL	1.099643
99% Chebyshev (MVUE) UCL	1.523473

95% Non-parametric UCLs	
CLT UCL	0.85891
Adj-CLT UCL (Adjusted for skewness)	0.939682
Mod-t UCL (Adjusted for skewness)	0.87869
Jackknife UCL	0.866092
Standard Bootstrap UCL	0.850288
Bootstrap-t UCL	1.02236
Hall's Bootstrap UCL	0.888994
Percentile Bootstrap UCL	0.851854
BCA Bootstrap UCL	1.042585
95% Chebyshev (Mean, Sd) UCL	1.358719
97.5% Chebyshev (Mean, Sd) UCL	1.706056
99% Chebyshev (Mean, Sd) UCL	2.388332

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: TETRACHLOROETHENE

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	55
Minimum	0.0025
Maximum	1300
Mean	51.60672
Median	1.25
Standard Deviation	217.0624
Variance	47116.08
Coefficient of Variation	4.206087
Skewness	4.95795

Gamma Statistics	
k hat	0.190046
k star (bias corrected)	0.191508
Theta hat	271.5491
Theta star	269.4753
nu hat	25.08602
nu star	25.27908
Approx.Chi Square Value (.05)	14.82363
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	14.64444

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	7.17012
Mean of log data	0.040518
Standard Deviation of log data	2.652033
Variance of log data	7.033277

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

317.4528

Normal Distribution Test	
Lilliefors Test Statisitic	0.498441
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	96.19022

Gamma Distribution Test	
A-D Test Statistic	8.745748
A-D 5% Critical Value	0.917619
K-S Test Statistic	0.337588
K-S 5% Critical Value	0.121991
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	88.00613
Adjusted Gamma UCL	89.08296

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.111272
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	143.4172
95% Chebyshev (MVUE) UCL	95.34533
97.5% Chebyshev (MVUE) UCL	124.3276
99% Chebyshev (MVUE) UCL	181.2576

95% Non-parametric UCLs	
CLT UCL	95.5548
Adj-CLT UCL (Adjusted for skewness)	112.9778
Mod-t UCL (Adjusted for skewness)	98.90785
Jackknife UCL	96.19022
Standard Bootstrap UCL	94.11441
Bootstrap-t UCL	195.84
Hall's Bootstrap UCL	138.1758
Percentile Bootstrap UCL	98.17552
BCA Bootstrap UCL	136.0753
95% Chebyshev (Mean, Sd) UCL	168.0701
97.5% Chebyshev (Mean, Sd) UCL	218.4639
99% Chebyshev (Mean, Sd) UCL	317.4528

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: TOLUENE

Raw Statistics	
Number of Valid Samples	65
Number of Unique Samples	22
Minimum	0.000415
Maximum	62
Mean	2.132616
Median	0.0425
Standard Deviation	8.883002
Variance	78.90772
Coefficient of Variation	4.165308
Skewness	5.523

Gamma Statistics	
k hat	0.170167
k star (bias corrected)	0.172569
Theta hat	12.53252
Theta star	12.35804
nu hat	22.12165
nu star	22.43399
Approx.Chi Square Value (.05)	12.66253
Adjusted Level of Significance	0.046308
Adjusted Chi Square Value	12.49559

Log-transformed Statistics	
Minimum of log data	-7.787232
Maximum of log data	4.127134
Mean of log data	-3.675791
Standard Deviation of log data	3.205584
Variance of log data	10.27577

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

13.0954

Normal Distribution Test	
Lilliefors Test Statisitic	0.495988
Lilliefors 5% Critical Value	0.109895
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	3.971536

Gamma Distribution Test	
A-D Test Statistic	7.511138
A-D 5% Critical Value	0.933125
K-S Test Statistic	0.354941
K-S 5% Critical Value	0.123649
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.778318
Adjusted Gamma UCL	3.828796

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.22651
Lilliefors 5% Critical Value	0.109895
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	31.75602
95% Chebyshev (MVUE) UCL	11.37993
97.5% Chebyshev (MVUE) UCL	15.05979
99% Chebyshev (MVUE) UCL	22.28818

95% Non-parametric UCLs	
CLT UCL	3.944917
Adj-CLT UCL (Adjusted for skewness)	4.751412
Mod-t UCL (Adjusted for skewness)	4.097332
Jackknife UCL	3.971536
Standard Bootstrap UCL	4.025897
Bootstrap-t UCL	6.825048
Hall's Bootstrap UCL	5.447479
Percentile Bootstrap UCL	4.111591
BCA Bootstrap UCL	5.414722
95% Chebyshev (Mean, Sd) UCL	6.935254
97.5% Chebyshev (Mean, Sd) UCL	9.01336
99% Chebyshev (Mean, Sd) UCL	13.0954

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\ Variable: TRICHLOROETHENE

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	32
Minimum	0.0025
Maximum	140
Mean	4.404461
Median	0.125
Standard Deviation	21.04959
Variance	443.0852
Coefficient of Variation	4.779153
Skewness	5.644332

Gamma Statistics	
k hat	0.181545
k star (bias corrected)	0.183394
Theta hat	24.26102
Theta star	24.01642
nu hat	23.96391
nu star	24.20797
Approx.Chi Square Value (.05)	14.0052
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	13.8315

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	4.941642
Mean of log data	-2.632098
Standard Deviation of log data	2.498436
Variance of log data	6.242181

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

30.18484

Normal Distribution Test	
Lilliefors Test Statisitic	0.49782
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	8.727938

Gamma Distribution Test	
A-D Test Statistic	10.97743
A-D 5% Critical Value	0.924334
K-S Test Statistic	0.437835
K-S 5% Critical Value	0.122306
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	7.613106
Adjusted Gamma UCL	7.708714

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.21811
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5.796987
95% Chebyshev (MVUE) UCL	4.369727
97.5% Chebyshev (MVUE) UCL	5.667519
99% Chebyshev (MVUE) UCL	8.21678

95% Non-parametric UCLs	
CLT UCL	8.666318
Adj-CLT UCL (Adjusted for skewness)	10.58982
Mod-t UCL (Adjusted for skewness)	9.027965
Jackknife UCL	8.727938
Standard Bootstrap UCL	8.670098
Bootstrap-t UCL	31.0795
Hall's Bootstrap UCL	34.78054
Percentile Bootstrap UCL	9.452285
BCA Bootstrap UCL	12.79722
95% Chebyshev (Mean, Sd) UCL	15.69848
97.5% Chebyshev (Mean, Sd) UCL	20.58541
99% Chebyshev (Mean, Sd) UCL	30.18484

Data File P:\10500_OMEGA\data\RA Data - Oct 2006\L Variable: TRICHLOROFLUOROMETHANE (FREON 11)

Raw Statistics	
Number of Valid Samples	66
Number of Unique Samples	27
Minimum	0.002
Maximum	220
Mean	6.552703
Median	0.0755
Standard Deviation	33.29198
Variance	1108.356
Coefficient of Variation	5.080648
Skewness	5.730696

Gamma Statistics	
k hat	0.155958
k star (bias corrected)	0.15897
Theta hat	42.01579
Theta star	41.21972
nu hat	20.58647
nu star	20.98405
Approx.Chi Square Value (.05)	11.5782
Adjusted Level of Significance	0.046364
Adjusted Chi Square Value	11.42177

Log-transformed Statistics	
Minimum of log data	-6.214608
Maximum of log data	5.393628
Mean of log data	-3.020272
Standard Deviation of log data	2.825708
Variance of log data	7.984628

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

47.32688

Normal Distribution Test	
Lilliefors Test Statisitic	0.496375
Lilliefors 5% Critical Value	0.109059
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	13.3907

Gamma Distribution Test	
A-D Test Statistic	11.17501
A-D 5% Critical Value	0.944546
K-S Test Statistic	0.411351
K-S 5% Critical Value	0.123253
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	11.87597
Adjusted Gamma UCL	12.03862

Lognormal Distribution Test	
Lilliefors Test Statisitic	0.188151
Lilliefors 5% Critical Value	0.109059
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	12.74071
95% Chebyshev (MVUE) UCL	7.225734
97.5% Chebyshev (MVUE) UCL	9.47223
99% Chebyshev (MVUE) UCL	13.88504

95% Non-parametric UCLs	
CLT UCL	13.29325
Adj-CLT UCL (Adjusted for skewness)	16.382
Mod-t UCL (Adjusted for skewness)	13.87249
Jackknife UCL	13.3907
Standard Bootstrap UCL	13.18345
Bootstrap-t UCL	70.71759
Hall's Bootstrap UCL	76.49448
Percentile Bootstrap UCL	14.28117
BCA Bootstrap UCL	19.45083
95% Chebyshev (Mean, Sd) UCL	24.41529
97.5% Chebyshev (Mean, Sd) UCL	32.14445
99% Chebyshev (Mean, Sd) UCL	47.32688

A-1.3 Indoor Air – Site Parcel

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,1,1-TRICHLOROETHANE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.0185
Maximum	1.7
Mean	0.290938
Median	0.053
Standard Deviation	0.580116
Variance	0.336535
Coefficient of Variation	1.993955
Skewness	2.64132

Gamma Statistics	
k hat	0.519952
k star (bias corrected)	0.408303
Theta hat	0.559547
Theta star	0.712553
nu hat	8.319224
nu star	6.532849
Approx.Chi Square Value (.05)	1.917406
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	1.351348

Log-transformed Statistics	
Minimum of log data	-3.989985
Maximum of log data	0.530628
Mean of log data	-2.448906
Standard Deviation of log data	1.471334
Variance of log data	2.164824

RECOMMENDATION

Data are lognormal (0.05)

Use 95% Chebyshev (MVUE) UCL

0.674406

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.536826
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.679519

Gamma Distribution Test	
A-D Test Statistic	1.14442
A-D 5% Critical Value	0.760994
K-S Test Statistic	0.396047
K-S 5% Critical Value	0.308597
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.991261
Adjusted Gamma UCL	1.406485

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.829154
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3.633228
95% Chebyshev (MVUE) UCL	0.674406
97.5% Chebyshev (MVUE) UCL	0.877414
99% Chebyshev (MVUE) UCL	1.276184

95% Non-parametric UCLs	
CLT UCL	0.6283
Adj-CLT UCL (Adjusted for skewness)	0.832957
Mod-t UCL (Adjusted for skewness)	0.711442
Jackknife UCL	0.679519
Standard Bootstrap UCL	0.599471
Bootstrap-t UCL	9.889703
Hall's Bootstrap UCL	4.747617
Percentile Bootstrap UCL	0.669313
BCA Bootstrap UCL	0.912813
95% Chebyshev (Mean, Sd) UCL	1.184957
97.5% Chebyshev (Mean, Sd) UCL	1.5718
99% Chebyshev (Mean, Sd) UCL	2.331677

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.21
Maximum	3.85
Mean	1.34125
Median	0.8
Standard Deviation	1.226126
Variance	1.503384
Coefficient of Variation	0.914166
Skewness	1.434011

Gamma Statistics	
k hat	1.520751
k star (bias corrected)	1.033802
Theta hat	0.881966
Theta star	1.297395
nu hat	24.33201
nu star	16.54084
Approx.Chi Square Value (.05)	8.343793
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	6.923346

Log-transformed Statistics	
Minimum of log data	-1.560648
Maximum of log data	1.348073
Mean of log data	-0.069891
Standard Deviation of log data	0.933716
Variance of log data	0.871826

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

2.162551

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.841156
Shapiro-Wilk 5% Critical Value	0.818
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.162551

Gamma Distribution Test	
A-D Test Statistic	0.282876
A-D 5% Critical Value	0.728235
K-S Test Statistic	0.201375
K-S 5% Critical Value	0.29884
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.658911
Adjusted Gamma UCL	3.204433

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.973422
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	4.672102
95% Chebyshev (MVUE) UCL	3.32161
97.5% Chebyshev (MVUE) UCL	4.176706
99% Chebyshev (MVUE) UCL	5.856378

95% Non-parametric UCLs	
CLT UCL	2.054295
Adj-CLT UCL (Adjusted for skewness)	2.289139
Mod-t UCL (Adjusted for skewness)	2.199182
Jackknife UCL	2.162551
Standard Bootstrap UCL	2.005831
Bootstrap-t UCL	3.009588
Hall's Bootstrap UCL	2.858334
Percentile Bootstrap UCL	2.01625
BCA Bootstrap UCL	2.47875
95% Chebyshev (Mean, Sd) UCL	3.230836
97.5% Chebyshev (Mean, Sd) UCL	4.048462
99% Chebyshev (Mean, Sd) UCL	5.654529

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,1-DICHLOROETHENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.17
Maximum	4.25
Mean	1.7425
Median	1.025
Standard Deviation	1.633242
Variance	2.667479
Coefficient of Variation	0.937298
Skewness	0.901945

Gamma Statistics	
k hat	1.185846
k star (bias corrected)	0.824487
Theta hat	1.469415
Theta star	2.113435
nu hat	18.97354
nu star	13.1918
Approx.Chi Square Value (.05)	6.020821
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	4.851312

Log-transformed Statistics	
Minimum of log data	-1.771957
Maximum of log data	1.446919
Mean of log data	0.077737
Standard Deviation of log data	1.129431
Variance of log data	1.275615

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

2.836502

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.832905
Shapiro-Wilk 5% Critical Value	0.818
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.836502

Gamma Distribution Test	
A-D Test Statistic	0.275692
A-D 5% Critical Value	0.732868
K-S Test Statistic	0.165059
K-S 5% Critical Value	0.300508
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.817869
Adjusted Gamma UCL	4.738245

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.954054
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	10.5247
95% Chebyshev (MVUE) UCL	5.08498
97.5% Chebyshev (MVUE) UCL	6.492689
99% Chebyshev (MVUE) UCL	9.257862

95% Non-parametric UCLs	
CLT UCL	2.692301
Adj-CLT UCL (Adjusted for skewness)	2.889054
Mod-t UCL (Adjusted for skewness)	2.867191
Jackknife UCL	2.836502
Standard Bootstrap UCL	2.631247
Bootstrap-t UCL	3.818513
Hall's Bootstrap UCL	3.042623
Percentile Bootstrap UCL	2.715
BCA Bootstrap UCL	2.49
95% Chebyshev (Mean, Sd) UCL	4.259495
97.5% Chebyshev (Mean, Sd) UCL	5.3486
99% Chebyshev (Mean, Sd) UCL	7.487937

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ACETONE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	10
Maximum	2500
Mean	672.875
Median	83
Standard Deviation	1050.187
Variance	1102893
Coefficient of Variation	1.560746
Skewness	1.375672

Gamma Statistics	
k hat	0.359856
k star (bias corrected)	0.308243
Theta hat	1869.847
Theta star	2182.936
nu hat	5.757689
nu star	4.931889
Approx.Chi Square Value (.05)	1.120453
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	0.731018

Log-transformed Statistics	
Minimum of log data	2.302585
Maximum of log data	7.824046
Mean of log data	4.651355
Standard Deviation of log data	2.340005
Variance of log data	5.475622

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 4539.619

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.677628
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1376.327

Gamma Distribution Test	
A-D Test Statistic	0.678201
A-D 5% Critical Value	0.786818
K-S Test Statistic	0.277333
K-S 5% Critical Value	0.314568
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2961.788
Adjusted Gamma UCL	4539.619

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.848522
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1024337
95% Chebyshev (MVUE) UCL	3257.403
97.5% Chebyshev (MVUE) UCL	4339.514
99% Chebyshev (MVUE) UCL	6465.113

95% Non-parametric UCLs	
CLT UCL	1283.604
Adj-CLT UCL (Adjusted for skewness)	1476.567
Mod-t UCL (Adjusted for skewness)	1406.425
Jackknife UCL	1376.327
Standard Bootstrap UCL	1262.334
Bootstrap-t UCL	4323.387
Hall's Bootstrap UCL	5811.855
Percentile Bootstrap UCL	1257
BCA Bootstrap UCL	1567.125
95% Chebyshev (Mean, Sd) UCL	2291.322
97.5% Chebyshev (Mean, Sd) UCL	2991.625
99% Chebyshev (Mean, Sd) UCL	4367.235

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: BENZENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	7
Minimum	0.88
Maximum	4.2
Mean	1.921875
Median	1.6
Standard Deviation	1.258491
Variance	1.5838
Coefficient of Variation	0.654825
Skewness	1.185372

Gamma Statistics	
k hat	3.108962
k star (bias corrected)	2.026435
Theta hat	0.618173
Theta star	0.948402
nu hat	49.74339
nu star	32.42295
Approx.Chi Square Value (.05)	20.40562
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	18.03393

Log-transformed Statistics	
Minimum of log data	-0.127833
Maximum of log data	1.435085
Mean of log data	0.483939
Standard Deviation of log data	0.607377
Variance of log data	0.368907

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

3.053711

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.80658
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.764856

Gamma Distribution Test	
A-D Test Statistic	0.576316
A-D 5% Critical Value	0.721154
K-S Test Statistic	0.219317
K-S 5% Critical Value	0.296194
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.053711
Adjusted Gamma UCL	3.455312

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.86917
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3.532686
95% Chebyshev (MVUE) UCL	3.704943
97.5% Chebyshev (MVUE) UCL	4.48537
99% Chebyshev (MVUE) UCL	6.018369

95% Non-parametric UCLs	
CLT UCL	2.653742
Adj-CLT UCL (Adjusted for skewness)	2.852991
Mod-t UCL (Adjusted for skewness)	2.795935
Jackknife UCL	2.764856
Standard Bootstrap UCL	2.601541
Bootstrap-t UCL	3.914061
Hall's Bootstrap UCL	8.069388
Percentile Bootstrap UCL	2.66125
BCA Bootstrap UCL	2.5475
95% Chebyshev (Mean, Sd) UCL	3.86134
97.5% Chebyshev (Mean, Sd) UCL	4.700548
99% Chebyshev (Mean, Sd) UCL	6.349009

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CARBON TETRACHLORIDE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	7
Minimum	0.065
Maximum	1.7
Mean	0.3255
Median	0.096
Standard Deviation	0.563443
Variance	0.317468
Coefficient of Variation	1.731007
Skewness	2.681767

Gamma Statistics	
k hat	0.794507
k star (bias corrected)	0.5799
Theta hat	0.409688
Theta star	0.561303
nu hat	12.71211
nu star	9.278403
Approx.Chi Square Value (.05)	3.4952
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	2.658749

Log-transformed Statistics	
Minimum of log data	-2.733368
Maximum of log data	0.530628
Mean of log data	-1.870066
Standard Deviation of log data	1.094402
Variance of log data	1.197715

RECOMMENDATION

Data are Non-parametric (0.05)

Use 99% Chebyshev (Mean, Sd) UCL

Recommer 2.307586

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.522443
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.702913

Gamma Distribution Test	
A-D Test Statistic	1.473911
A-D 5% Critical Value	0.743416
K-S Test Statistic	0.423596
K-S 5% Critical Value	0.303597
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.864077
Adjusted Gamma UCL	1.135918

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.710183
Shapiro-Wilk 5% Critical Value	0.818
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.32025
95% Chebyshev (MVUE) UCL	0.689383
97.5% Chebyshev (MVUE) UCL	0.878081
99% Chebyshev (MVUE) UCL	1.248741

95% Non-parametric UCLs	
CLT UCL	0.653167
Adj-CLT UCL (Adjusted for skewness)	0.854985
Mod-t UCL (Adjusted for skewness)	0.734393
Jackknife UCL	0.702913
Standard Bootstrap UCL	0.621824
Bootstrap-t UCL	10.65327
Hall's Bootstrap UCL	6.75975
Percentile Bootstrap UCL	0.69625
BCA Bootstrap UCL	0.927
95% Chebyshev (Mean, Sd) UCL	1.193824
97.5% Chebyshev (Mean, Sd) UCL	1.569548
99% Chebyshev (Mean, Sd) UCL	2.307586

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CHLOROFORM

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.0165
Maximum	1.7
Mean	0.287063
Median	0.0485
Standard Deviation	0.582049
Variance	0.338781
Coefficient of Variation	2.027605
Skewness	2.635837

Gamma Statistics	
k hat	0.481359
k star (bias corrected)	0.384183
Theta hat	0.596358
Theta star	0.747203
nu hat	7.701747
nu star	6.146925
Approx.Chi Square Value (.05)	1.714892
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	1.190004

Log-transformed Statistics	
Minimum of log data	-4.104395
Maximum of log data	0.530628
Mean of log data	-2.575446
Standard Deviation of log data	1.570486
Variance of log data	2.466427

RECOMMENDATION

Data are lognormal (0.05)

Use 99% Chebyshev (MVUE) UCL

1.319098

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.53989
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.676939

Gamma Distribution Test	
A-D Test Statistic	1.031405
A-D 5% Critical Value	0.765622
K-S Test Statistic	0.374879
K-S 5% Critical Value	0.309732
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.028958
Adjusted Gamma UCL	1.482811

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.851668
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5.258663
95% Chebyshev (MVUE) UCL	0.691321
97.5% Chebyshev (MVUE) UCL	0.9031
99% Chebyshev (MVUE) UCL	1.319098

95% Non-parametric UCLs	
CLT UCL	0.62555
Adj-CLT UCL (Adjusted for skewness)	0.830462
Mod-t UCL (Adjusted for skewness)	0.708902
Jackknife UCL	0.676939
Standard Bootstrap UCL	0.608283
Bootstrap-t UCL	8.703829
Hall's Bootstrap UCL	3.954548
Percentile Bootstrap UCL	0.66225
BCA Bootstrap UCL	0.907188
95% Chebyshev (Mean, Sd) UCL	1.184061
97.5% Chebyshev (Mean, Sd) UCL	1.572193
99% Chebyshev (Mean, Sd) UCL	2.334602

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Ja Variable: DICHLORODIFLUOROMETHANE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.28
Maximum	1.7
Mean	0.614375
Median	0.5025
Standard Deviation	0.451596
Variance	0.203939
Coefficient of Variation	0.735049
Skewness	2.510509

Gamma Statistics	
k hat	3.411926
k star (bias corrected)	2.215787
Theta hat	0.180067
Theta star	0.277272
nu hat	54.59082
nu star	35.4526
Approx.Chi Square Value (.05)	22.82623
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	20.30149

Log-transformed Statistics	
Minimum of log data	-1.272966
Maximum of log data	0.530628
Mean of log data	-0.640794
Standard Deviation of log data	0.536107
Variance of log data	0.287411

RECOMMENDATION

Data are lognormal (0.05)

Use H-UCL

0.999078

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.652515
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.91687

Gamma Distribution Test	
A-D Test Statistic	0.803231
A-D 5% Critical Value	0.720275
K-S Test Statistic	0.296415
K-S 5% Critical Value	0.2959
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.954217
Adjusted Gamma UCL	1.072886

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.857176
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.999078
95% Chebyshev (MVUE) UCL	1.094744
97.5% Chebyshev (MVUE) UCL	1.310356
99% Chebyshev (MVUE) UCL	1.733883

95% Non-parametric UCLs	
CLT UCL	0.876998
Adj-CLT UCL (Adjusted for skewness)	1.028424
Mod-t UCL (Adjusted for skewness)	0.940489
Jackknife UCL	0.91687
Standard Bootstrap UCL	0.853268
Bootstrap-t UCL	1.536195
Hall's Bootstrap UCL	2.105318
Percentile Bootstrap UCL	0.914375
BCA Bootstrap UCL	1.085
95% Chebyshev (Mean, Sd) UCL	1.310331
97.5% Chebyshev (Mean, Sd) UCL	1.611472
99% Chebyshev (Mean, Sd) UCL	2.203004

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ETHYLBENZENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.73
Maximum	11
Mean	2.77875
Median	1.4
Standard Deviation	3.468707
Variance	12.03193
Coefficient of Variation	1.248298
Skewness	2.414179

Gamma Statistics	
k hat	1.25947
k star (bias corrected)	0.870502
Theta hat	2.206285
Theta star	3.192123
nu hat	20.15152
nu star	13.92804
Approx.Chi Square Value (.05)	6.520974
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	5.294004

Log-transformed Statistics	
Minimum of log data	-0.314711
Maximum of log data	2.397895
Mean of log data	0.575136
Standard Deviation of log data	0.911334
Variance of log data	0.83053

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

5.935085

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.643871
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	5.10221

Gamma Distribution Test	
A-D Test Statistic	0.720078
A-D 5% Critical Value	0.731826
K-S Test Statistic	0.257258
K-S 5% Critical Value	0.300132
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	5.935085
Adjusted Gamma UCL	7.310635

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.880937
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	8.319492
95% Chebyshev (MVUE) UCL	6.13634
97.5% Chebyshev (MVUE) UCL	7.700337
99% Chebyshev (MVUE) UCL	10.77251

95% Non-parametric UCLs	
CLT UCL	4.795954
Adj-CLT UCL (Adjusted for skewness)	5.914432
Mod-t UCL (Adjusted for skewness)	5.27667
Jackknife UCL	5.10221
Standard Bootstrap UCL	4.625138
Bootstrap-t UCL	14.33418
Hall's Bootstrap UCL	13.12687
Percentile Bootstrap UCL	4.94625
BCA Bootstrap UCL	4.78125
95% Chebyshev (Mean, Sd) UCL	8.124386
97.5% Chebyshev (Mean, Sd) UCL	10.43745
99% Chebyshev (Mean, Sd) UCL	14.98101

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: M,P-XYLENES

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	3.3
Maximum	61
Mean	13.81875
Median	4.7
Standard Deviation	19.80966
Variance	392.4228
Coefficient of Variation	1.433535
Skewness	2.45894

Gamma Statistics	
k hat	0.980775
k star (bias corrected)	0.696318
Theta hat	14.08962
Theta star	19.84546
nu hat	15.69241
nu star	11.14109
Approx.Chi Square Value (.05)	4.66596
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	3.6646

Log-transformed Statistics	
Minimum of log data	1.193922
Maximum of log data	4.110874
Mean of log data	2.036147
Standard Deviation of log data	1.036999
Variance of log data	1.075367

RECOMMENDATION

Data are lognormal (0.05)

Use 95% Chebyshev (MVUE) UCL

31.56974

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.612758
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	27.08795

Gamma Distribution Test	
A-D Test Statistic	0.917656
A-D 5% Critical Value	0.736241
K-S Test Statistic	0.322304
K-S 5% Critical Value	0.30166
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	32.99555
Adjusted Gamma UCL	42.01165

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.821956
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	53.6707
95% Chebyshev (MVUE) UCL	31.56974
97.5% Chebyshev (MVUE) UCL	40.03976
99% Chebyshev (MVUE) UCL	56.67747

95% Non-parametric UCLs	
CLT UCL	25.33893
Adj-CLT UCL (Adjusted for skewness)	31.84495
Mod-t UCL (Adjusted for skewness)	28.10276
Jackknife UCL	27.08795
Standard Bootstrap UCL	24.56013
Bootstrap-t UCL	88.59628
Hall's Bootstrap UCL	88.8646
Percentile Bootstrap UCL	25.53125
BCA Bootstrap UCL	24.7125
95% Chebyshev (Mean, Sd) UCL	44.34749
97.5% Chebyshev (Mean, Sd) UCL	57.55731
99% Chebyshev (Mean, Sd) UCL	83.50542

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: METHYLENE CHLORIDE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.43
Maximum	74
Mean	13.94125
Median	2.5
Standard Deviation	25.13349
Variance	631.6922
Coefficient of Variation	1.802815
Skewness	2.475227

Gamma Statistics	
k hat	0.441718
k star (bias corrected)	0.359407
Theta hat	31.56144
Theta star	38.78959
nu hat	7.067486
nu star	5.750512
Approx.Chi Square Value (.05)	1.513252
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	1.031569

Log-transformed Statistics	
Minimum of log data	-0.84397
Maximum of log data	4.304065
Mean of log data	1.168599
Standard Deviation of log data	1.919441
Variance of log data	3.684255

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 77.71591

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.616288
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	30.77653

Gamma Distribution Test	
A-D Test Statistic	0.539723
A-D 5% Critical Value	0.772537
K-S Test Statistic	0.21871
K-S 5% Critical Value	0.31131
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	52.97818
Adjusted Gamma UCL	77.71591

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.904581
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1649.826
95% Chebyshev (MVUE) UCL	50.47385
97.5% Chebyshev (MVUE) UCL	66.66813
99% Chebyshev (MVUE) UCL	98.47866

95% Non-parametric UCLs	
CLT UCL	28.55747
Adj-CLT UCL (Adjusted for skewness)	36.86665
Mod-t UCL (Adjusted for skewness)	32.0726
Jackknife UCL	30.77653
Standard Bootstrap UCL	27.52104
Bootstrap-t UCL	73.20898
Hall's Bootstrap UCL	78.27732
Percentile Bootstrap UCL	28.9325
BCA Bootstrap UCL	28.18
95% Chebyshev (Mean, Sd) UCL	52.67456
97.5% Chebyshev (Mean, Sd) UCL	69.43449
99% Chebyshev (Mean, Sd) UCL	102.3561

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: O-XYLENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.66
Maximum	18
Mean	3.85125
Median	1.5
Standard Deviation	5.815633
Variance	33.82158
Coefficient of Variation	1.510064
Skewness	2.646956

Gamma Statistics	
k hat	0.967499
k star (bias corrected)	0.68802
Theta hat	3.980624
Theta star	5.597583
nu hat	15.47998
nu star	11.00832
Approx.Chi Square Value (.05)	4.580436
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	3.590415

Log-transformed Statistics	
Minimum of log data	-0.415515
Maximum of log data	2.890372
Mean of log data	0.749453
Standard Deviation of log data	1.031778
Variance of log data	1.064566

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Approximate Gamma UCL

9.255846

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.577544
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	7.746762

Gamma Distribution Test	
A-D Test Statistic	0.838391
A-D 5% Critical Value	0.736752
K-S Test Statistic	0.261548
K-S 5% Critical Value	0.301798
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	9.255846
Adjusted Gamma UCL	11.80805

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.886745
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	14.56191
95% Chebyshev (MVUE) UCL	8.654495
97.5% Chebyshev (MVUE) UCL	10.97201
99% Chebyshev (MVUE) UCL	15.52432

95% Non-parametric UCLs	
CLT UCL	7.233294
Adj-CLT UCL (Adjusted for skewness)	9.289346
Mod-t UCL (Adjusted for skewness)	8.067465
Jackknife UCL	7.746762
Standard Bootstrap UCL	6.965566
Bootstrap-t UCL	22.77419
Hall's Bootstrap UCL	19.92734
Percentile Bootstrap UCL	7.71875
BCA Bootstrap UCL	10.7125
95% Chebyshev (Mean, Sd) UCL	12.81374
97.5% Chebyshev (Mean, Sd) UCL	16.69182
99% Chebyshev (Mean, Sd) UCL	24.30955

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TETRACHLOROETHENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.15
Maximum	5
Mean	1.69125
Median	1.4
Standard Deviation	1.527878
Variance	2.334413
Coefficient of Variation	0.903402
Skewness	1.61442

Gamma Statistics	
k hat	1.360207
k star (bias corrected)	0.933463
Theta hat	1.243376
Theta star	1.811802
nu hat	21.76332
nu star	14.93541
Approx.Chi Square Value (.05)	7.215454
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	5.912059

Log-transformed Statistics	
Minimum of log data	-1.89712
Maximum of log data	1.609438
Mean of log data	0.114842
Standard Deviation of log data	1.078285
Variance of log data	1.162698

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

2.714676

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.858922
Shapiro-Wilk 5% Critical Value	0.818
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.714676

Gamma Distribution Test	
A-D Test Statistic	0.155992
A-D 5% Critical Value	0.730399
K-S Test Statistic	0.120937
K-S 5% Critical Value	0.299616
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.500751
Adjusted Gamma UCL	4.27254

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.96243
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	9.071665
95% Chebyshev (MVUE) UCL	4.902937
97.5% Chebyshev (MVUE) UCL	6.237701
99% Chebyshev (MVUE) UCL	8.859587

95% Non-parametric UCLs	
CLT UCL	2.579778
Adj-CLT UCL (Adjusted for skewness)	2.909233
Mod-t UCL (Adjusted for skewness)	2.766064
Jackknife UCL	2.714676
Standard Bootstrap UCL	2.536564
Bootstrap-t UCL	3.400869
Hall's Bootstrap UCL	6.762071
Percentile Bootstrap UCL	2.5525
BCA Bootstrap UCL	3.1625
95% Chebyshev (Mean, Sd) UCL	4.045869
97.5% Chebyshev (Mean, Sd) UCL	5.064714
99% Chebyshev (Mean, Sd) UCL	7.066039

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TOLUENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	7
Minimum	8.9
Maximum	620
Mean	104.7875
Median	15
Standard Deviation	211.3136
Variance	44653.43
Coefficient of Variation	2.016592
Skewness	2.674394

Gamma Statistics	
k hat	0.498191
k star (bias corrected)	0.394703
Theta hat	210.336
Theta star	265.4846
nu hat	7.971058
nu star	6.315244
Approx.Chi Square Value (.05)	1.8025
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	1.259549

Log-transformed Statistics	
Minimum of log data	2.186051
Maximum of log data	6.429719
Mean of log data	3.376242
Standard Deviation of log data	1.536904
Variance of log data	2.362075

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Adjusted Gamma UCL

525.3933

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.537447
Shapiro-Wilk 5% Critical Value	0.818
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	246.3327

Gamma Distribution Test	
A-D Test Statistic	1.036544
A-D 5% Critical Value	0.762686
K-S Test Statistic	0.286287
K-S 5% Critical Value	0.309062
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	367.1339
Adjusted Gamma UCL	525.3933

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.80884
Shapiro-Wilk 5% Critical Value	0.818
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1702.662
95% Chebyshev (MVUE) UCL	252.4162
97.5% Chebyshev (MVUE) UCL	329.3038
99% Chebyshev (MVUE) UCL	480.3348

95% Non-parametric UCLs	
CLT UCL	227.6756
Adj-CLT UCL (Adjusted for skewness)	303.1575
Mod-t UCL (Adjusted for skewness)	258.1063
Jackknife UCL	246.3327
Standard Bootstrap UCL	221.4433
Bootstrap-t UCL	1601.502
Hall's Bootstrap UCL	1361.745
Percentile Bootstrap UCL	244.3375
BCA Bootstrap UCL	329.375
95% Chebyshev (Mean, Sd) UCL	430.4436
97.5% Chebyshev (Mean, Sd) UCL	571.3553
99% Chebyshev (Mean, Sd) UCL	848.1489

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TRICHLOROETHENE

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.046
Maximum	1.7
Mean	0.631375
Median	0.51
Standard Deviation	0.540498
Variance	0.292138
Coefficient of Variation	0.856065
Skewness	1.196758

Gamma Statistics	
k hat	1.323409
k star (bias corrected)	0.910464
Theta hat	0.477082
Theta star	0.693465
nu hat	21.17454
nu star	14.56742
Approx.Chi Square Value (.05)	6.960474
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	5.684715

Log-transformed Statistics	
Minimum of log data	-3.079114
Maximum of log data	0.530628
Mean of log data	-0.883029
Standard Deviation of log data	1.131649
Variance of log data	1.280631

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.993419

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.903153
Shapiro-Wilk 5% Critical Value	0.818
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.993419

Gamma Distribution Test	
A-D Test Statistic	0.161723
A-D 5% Critical Value	0.730921
K-S Test Statistic	0.136901
K-S 5% Critical Value	0.299804
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.321391
Adjusted Gamma UCL	1.617936

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.940957
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	4.0601
95% Chebyshev (MVUE) UCL	1.951756
97.5% Chebyshev (MVUE) UCL	2.49245
99% Chebyshev (MVUE) UCL	3.554538

95% Non-parametric UCLs	
CLT UCL	0.945698
Adj-CLT UCL (Adjusted for skewness)	1.032094
Mod-t UCL (Adjusted for skewness)	1.006895
Jackknife UCL	0.993419
Standard Bootstrap UCL	0.929909
Bootstrap-t UCL	1.275243
Hall's Bootstrap UCL	2.890993
Percentile Bootstrap UCL	0.95875
BCA Bootstrap UCL	1.1325
95% Chebyshev (Mean, Sd) UCL	1.464338
97.5% Chebyshev (Mean, Sd) UCL	1.824762
99% Chebyshev (Mean, Sd) UCL	2.532745

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: TRICHLOROFLUOROMETHANE (FREON 11)

Raw Statistics	
Number of Valid Samples	8
Number of Unique Samples	8
Minimum	0.35
Maximum	2.35
Mean	1.115
Median	0.84
Standard Deviation	0.780531
Variance	0.609229
Coefficient of Variation	0.700028
Skewness	0.60242

Gamma Statistics	
k hat	2.246787
k star (bias corrected)	1.487575
Theta hat	0.496264
Theta star	0.749542
nu hat	35.94858
nu star	23.8012
Approx.Chi Square Value (.05)	13.69587
Adjusted Level of Significance	0.01946
Adjusted Chi Square Value	11.80263

Log-transformed Statistics	
Minimum of log data	-1.049822
Maximum of log data	0.854415
Mean of log data	-0.129893
Standard Deviation of log data	0.757846
Variance of log data	0.574331

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

1.637827

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.878304
Shapiro-Wilk 5% Critical Value	0.818
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.637827

Gamma Distribution Test	
A-D Test Statistic	0.384466
A-D 5% Critical Value	0.723353
K-S Test Statistic	0.189918
K-S 5% Critical Value	0.297174
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.937689
Adjusted Gamma UCL	2.24851

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.909108
Shapiro-Wilk 5% Critical Value	0.818
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2.692584
95% Chebyshev (MVUE) UCL	2.454724
97.5% Chebyshev (MVUE) UCL	3.031566
99% Chebyshev (MVUE) UCL	4.164661

95% Non-parametric UCLs	
CLT UCL	1.568913
Adj-CLT UCL (Adjusted for skewness)	1.631716
Mod-t UCL (Adjusted for skewness)	1.647623
Jackknife UCL	1.637827
Standard Bootstrap UCL	1.532436
Bootstrap-t UCL	1.747977
Hall's Bootstrap UCL	1.482512
Percentile Bootstrap UCL	1.55625
BCA Bootstrap UCL	1.7125
95% Chebyshev (Mean, Sd) UCL	2.317879
97.5% Chebyshev (Mean, Sd) UCL	2.838366
99% Chebyshev (Mean, Sd) UCL	3.860761

A-1.4 Indoor Air – North Parcel

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.25
Maximum	5.1
Mean	3.31
Median	4.4
Standard Deviation	2.040343
Variance	4.163
Coefficient of Variation	0.616418
Skewness	-1.022453

Gamma Statistics	
k hat	1.428656
k star (bias corrected)	0.704796
Theta hat	2.316864
Theta star	4.696397
nu hat	14.28656
nu star	7.047956
Approx.Chi Square Value (.05)	2.196304
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	1.204859

Log-transformed Statistics	
Minimum of log data	-1.386294
Maximum of log data	1.629241
Mean of log data	0.807813
Standard Deviation of log data	1.270737
Variance of log data	1.614773

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

Recommer 5.255244

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.868273
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	5.255244

Gamma Distribution Test	
A-D Test Statistic	0.654642
A-D 5% Critical Value	0.687096
K-S Test Statistic	0.336552
K-S 5% Critical Value	0.362061
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	10.62181
Adjusted Gamma UCL	19.36221

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.737192
Shapiro-Wilk 5% Critical Value	0.762
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	241.4026
95% Chebyshev (MVUE) UCL	13.34531
97.5% Chebyshev (MVUE) UCL	17.37192
99% Chebyshev (MVUE) UCL	25.28142

95% Non-parametric UCLs	
CLT UCL	4.810878
Adj-CLT UCL (Adjusted for skewness)	4.365061
Mod-t UCL (Adjusted for skewness)	5.185705
Jackknife UCL	5.255244
Standard Bootstrap UCL	4.704565
Bootstrap-t UCL	4.782427
Hall's Bootstrap UCL	4.203785
Percentile Bootstrap UCL	4.66
BCA Bootstrap UCL	4.8
95% Chebyshev (Mean, Sd) UCL	7.287361
97.5% Chebyshev (Mean, Sd) UCL	9.008368
99% Chebyshev (Mean, Sd) UCL	12.38895

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,1-DICHLOROETHENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.06
Maximum	2.6
Mean	1.26
Median	1.3
Standard Deviation	0.951735
Variance	0.9058
Coefficient of Variation	0.755345
Skewness	0.278813

Gamma Statistics	
k hat	1.105035
k star (bias corrected)	0.575347
Theta hat	1.140236
Theta star	2.189982
nu hat	11.05035
nu star	5.753472
Approx.Chi Square Value (.05)	1.514732
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.755916

Log-transformed Statistics	
Minimum of log data	-2.813411
Maximum of log data	0.955511
Mean of log data	-0.285327
Standard Deviation of log data	1.483377
Variance of log data	2.200407

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

2.167375

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.99175
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.167375

Gamma Distribution Test	
A-D Test Statistic	0.366089
A-D 5% Critical Value	0.6903
K-S Test Statistic	0.238049
K-S 5% Critical Value	0.363834
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	4.785913
Adjusted Gamma UCL	9.590188

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.822679
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	419.8855
95% Chebyshev (MVUE) UCL	5.916271
97.5% Chebyshev (MVUE) UCL	7.767175
99% Chebyshev (MVUE) UCL	11.40292

95% Non-parametric UCLs	
CLT UCL	1.960097
Adj-CLT UCL (Adjusted for skewness)	2.016805
Mod-t UCL (Adjusted for skewness)	2.176221
Jackknife UCL	2.167375
Standard Bootstrap UCL	1.889694
Bootstrap-t UCL	2.246521
Hall's Bootstrap UCL	2.098295
Percentile Bootstrap UCL	1.892
BCA Bootstrap UCL	2.14
95% Chebyshev (Mean, Sd) UCL	3.115274
97.5% Chebyshev (Mean, Sd) UCL	3.918052
99% Chebyshev (Mean, Sd) UCL	5.494955

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,4-DICHLOROBENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.017
Maximum	0.15
Mean	0.0679
Median	0.034
Standard Deviation	0.06252
Variance	0.003909
Coefficient of Variation	0.920772
Skewness	0.687837

Gamma Statistics	
k hat	1.383857
k star (bias corrected)	0.686876
Theta hat	0.049066
Theta star	0.098853
nu hat	13.83857
nu star	6.86876
Approx.Chi Square Value (.05)	2.098228
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	1.138176

Log-transformed Statistics	
Minimum of log data	-4.074542
Maximum of log data	-1.89712
Mean of log data	-3.092661
Standard Deviation of log data	1.028047
Variance of log data	1.056881

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.127506

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.815003
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.127506

Gamma Distribution Test	
A-D Test Statistic	0.50727
A-D 5% Critical Value	0.68754
K-S Test Statistic	0.266707
K-S 5% Critical Value	0.362306
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.222277
Adjusted Gamma UCL	0.409769

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.852381
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.019411
95% Chebyshev (MVUE) UCL	0.196732
97.5% Chebyshev (MVUE) UCL	0.252664
99% Chebyshev (MVUE) UCL	0.362533

95% Non-parametric UCLs	
CLT UCL	0.11389
Adj-CLT UCL (Adjusted for skewness)	0.12308
Mod-t UCL (Adjusted for skewness)	0.12894
Jackknife UCL	0.127506
Standard Bootstrap UCL	0.108886
Bootstrap-t UCL	0.370213
Hall's Bootstrap UCL	0.836412
Percentile Bootstrap UCL	0.1117
BCA Bootstrap UCL	0.1036
95% Chebyshev (Mean, Sd) UCL	0.189775
97.5% Chebyshev (Mean, Sd) UCL	0.24251
99% Chebyshev (Mean, Sd) UCL	0.346098

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ACETONE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	9.1
Maximum	1400
Mean	365.02
Median	180
Standard Deviation	586.2894
Variance	343735.2
Coefficient of Variation	1.606184
Skewness	2.091655

Gamma Statistics	
k hat	0.478175
k star (bias corrected)	0.324603
Theta hat	763.3603
Theta star	1124.511
nu hat	4.781753
nu star	3.246034
Approx.Chi Square Value (.05)	0.448686
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.169703

Log-transformed Statistics	
Minimum of log data	2.208274
Maximum of log data	7.244228
Mean of log data	4.562335
Standard Deviation of log data	2.063133
Variance of log data	4.256518

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 6982.003

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.689434
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	923.9827

Gamma Distribution Test	
A-D Test Statistic	0.344328
A-D 5% Critical Value	0.714037
K-S Test Statistic	0.230604
K-S 5% Critical Value	0.372525
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2640.75
Adjusted Gamma UCL	6982.003

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.930058
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	17375835
95% Chebyshev (MVUE) UCL	1637.648
97.5% Chebyshev (MVUE) UCL	2180.622
99% Chebyshev (MVUE) UCL	3247.189

95% Non-parametric UCLs	
CLT UCL	796.295
Adj-CLT UCL (Adjusted for skewness)	1058.362
Mod-t UCL (Adjusted for skewness)	964.8599
Jackknife UCL	923.9827
Standard Bootstrap UCL	749.9999
Bootstrap-t UCL	2336.907
Hall's Bootstrap UCL	3284.391
Percentile Bootstrap UCL	846.4
BCA Bootstrap UCL	928
95% Chebyshev (Mean, Sd) UCL	1507.908
97.5% Chebyshev (Mean, Sd) UCL	2002.437
99% Chebyshev (Mean, Sd) UCL	2973.843

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: BENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.28
Maximum	0.33
Mean	0.31
Median	0.31
Standard Deviation	0.021213
Variance	0.00045
Coefficient of Variation	0.06843
Skewness	-0.523783

Gamma Statistics	
k hat	262.4464
k star (bias corrected)	105.1119
Theta hat	0.001181
Theta star	0.002949
nu hat	2624.464
nu star	1051.119
Approx.Chi Square Value (.05)	976.8406
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	944.9912

Log-transformed Statistics	
Minimum of log data	-1.272966
Maximum of log data	-1.108663
Mean of log data	-1.173089
Standard Deviation of log data	0.069344
Variance of log data	0.004809

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

Recommer 0.330224

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.909856
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.330224

Gamma Distribution Test	
A-D Test Statistic	0.331405
A-D 5% Critical Value	0.67808
K-S Test Statistic	0.251752
K-S 5% Critical Value	0.35682
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.333572
Adjusted Gamma UCL	0.344815

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.908548
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	N/A
95% Chebyshev (MVUE) UCL	0.351904
97.5% Chebyshev (MVUE) UCL	0.370033
99% Chebyshev (MVUE) UCL	0.405645

95% Non-parametric UCLs	
CLT UCL	0.325604
Adj-CLT UCL (Adjusted for skewness)	0.32323
Mod-t UCL (Adjusted for skewness)	0.329854
Jackknife UCL	0.330224
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.351352
97.5% Chebyshev (Mean, Sd) UCL	0.369245
99% Chebyshev (Mean, Sd) UCL	0.404393

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CARBON TETRACHLORIDE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.1
Maximum	0.2
Mean	0.136
Median	0.13
Standard Deviation	0.037815
Variance	0.00143
Coefficient of Variation	0.278054
Skewness	1.625492

Gamma Statistics	
k hat	18.38321
k star (bias corrected)	7.486618
Theta hat	0.007398
Theta star	0.018166
nu hat	183.8321
nu star	74.86618
Approx.Chi Square Value (.05)	55.93471
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	48.84712

Log-transformed Statistics	
Minimum of log data	-2.302585
Maximum of log data	-1.609438
Mean of log data	-2.022546
Standard Deviation of log data	0.254585
Variance of log data	0.064813

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.172053

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.829281
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.172053

Gamma Distribution Test	
A-D Test Statistic	0.48505
A-D 5% Critical Value	0.678721
K-S Test Statistic	0.345334
K-S 5% Critical Value	0.35723
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.18203
Adjusted Gamma UCL	0.208442

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.88863
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.183265
95% Chebyshev (MVUE) UCL	0.203013
97.5% Chebyshev (MVUE) UCL	0.232105
99% Chebyshev (MVUE) UCL	0.289252

95% Non-parametric UCLs	
CLT UCL	0.163817
Adj-CLT UCL (Adjusted for skewness)	0.176953
Mod-t UCL (Adjusted for skewness)	0.174102
Jackknife UCL	0.172053
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.209716
97.5% Chebyshev (Mean, Sd) UCL	0.241612
99% Chebyshev (Mean, Sd) UCL	0.304268

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CHLOROFORM

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.041
Maximum	0.12
Mean	0.065
Median	0.056
Standard Deviation	0.03245
Variance	0.001053
Coefficient of Variation	0.49923
Skewness	1.702965

Gamma Statistics	
k hat	6.139899
k star (bias corrected)	2.589293
Theta hat	0.010586
Theta star	0.025103
nu hat	61.39899
nu star	25.89293
Approx.Chi Square Value (.05)	15.29512
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	11.88629

Log-transformed Statistics	
Minimum of log data	-3.194183
Maximum of log data	-2.120264
Mean of log data	-2.817007
Standard Deviation of log data	0.437732
Variance of log data	0.191609

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.095937

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.806804
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.095937

Gamma Distribution Test	
A-D Test Statistic	0.436577
A-D 5% Critical Value	0.680293
K-S Test Statistic	0.231417
K-S 5% Critical Value	0.358146
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.110038
Adjusted Gamma UCL	0.141595

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.883289
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.120302
95% Chebyshev (MVUE) UCL	0.119135
97.5% Chebyshev (MVUE) UCL	0.142783
99% Chebyshev (MVUE) UCL	0.189233

95% Non-parametric UCLs	
CLT UCL	0.08887
Adj-CLT UCL (Adjusted for skewness)	0.10068
Mod-t UCL (Adjusted for skewness)	0.09778
Jackknife UCL	0.095937
Standard Bootstrap UCL	0.08623
Bootstrap-t UCL	0.13681
Hall's Bootstrap UCL	0.188276
Percentile Bootstrap UCL	0.0886
BCA Bootstrap UCL	0.0828
95% Chebyshev (Mean, Sd) UCL	0.128257
97.5% Chebyshev (Mean, Sd) UCL	0.155628
99% Chebyshev (Mean, Sd) UCL	0.209393

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Ja Variable: DICHLORODIFLUOROMETHANE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.25
Maximum	0.66
Mean	0.462
Median	0.51
Standard Deviation	0.156748
Variance	0.02457
Coefficient of Variation	0.339282
Skewness	-0.242204

Gamma Statistics	
k hat	9.691802
k star (bias corrected)	4.010054
Theta hat	0.047669
Theta star	0.11521
nu hat	96.91802
nu star	40.10054
Approx.Chi Square Value (.05)	26.58891
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	21.9021

Log-transformed Statistics	
Minimum of log data	-1.386294
Maximum of log data	-0.415515
Mean of log data	-0.824667
Standard Deviation of log data	0.37538
Variance of log data	0.14091

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.611442

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.969515
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.611442

Gamma Distribution Test	
A-D Test Statistic	0.279991
A-D 5% Critical Value	0.678993
K-S Test Statistic	0.262507
K-S 5% Critical Value	0.357634
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.696774
Adjusted Gamma UCL	0.845875

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.938481
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.764193
95% Chebyshev (MVUE) UCL	0.801094
97.5% Chebyshev (MVUE) UCL	0.947146
99% Chebyshev (MVUE) UCL	1.234037

95% Non-parametric UCLs	
CLT UCL	0.577304
Adj-CLT UCL (Adjusted for skewness)	0.569191
Mod-t UCL (Adjusted for skewness)	0.610177
Jackknife UCL	0.611442
Standard Bootstrap UCL	0.565191
Bootstrap-t UCL	0.611792
Hall's Bootstrap UCL	0.554593
Percentile Bootstrap UCL	0.572
BCA Bootstrap UCL	0.576
95% Chebyshev (Mean, Sd) UCL	0.767559
97.5% Chebyshev (Mean, Sd) UCL	0.899774
99% Chebyshev (Mean, Sd) UCL	1.159485

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ETHYLBENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.12
Maximum	0.19
Mean	0.168
Median	0.18
Standard Deviation	0.027749
Variance	0.00077
Coefficient of Variation	0.165172
Skewness	-1.881438

Gamma Statistics	
k hat	39.47911
k star (bias corrected)	15.92498
Theta hat	0.004255
Theta star	0.010549
nu hat	394.7911
nu star	159.2498
Approx.Chi Square Value (.05)	131.0694
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	119.8586

Log-transformed Statistics	
Minimum of log data	-2.120264
Maximum of log data	-1.660731
Mean of log data	-1.79651
Standard Deviation of log data	0.185208
Variance of log data	0.034302

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

Recommer 0.194456

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.777479
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.194456

Gamma Distribution Test	
A-D Test Statistic	0.742214
A-D 5% Critical Value	0.678411
K-S Test Statistic	0.350742
K-S 5% Critical Value	0.356965
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.204121
Adjusted Gamma UCL	0.223213

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.74257
Shapiro-Wilk 5% Critical Value	0.762
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.206328
95% Chebyshev (MVUE) UCL	0.228806
97.5% Chebyshev (MVUE) UCL	0.255046
99% Chebyshev (MVUE) UCL	0.30659

95% Non-parametric UCLs	
CLT UCL	0.188412
Adj-CLT UCL (Adjusted for skewness)	0.177255
Mod-t UCL (Adjusted for skewness)	0.192715
Jackknife UCL	0.194456
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.222093
97.5% Chebyshev (Mean, Sd) UCL	0.245498
99% Chebyshev (Mean, Sd) UCL	0.291475

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: METHYLENE CHLORIDE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.185
Maximum	1.4
Mean	0.873
Median	1.1
Standard Deviation	0.515747
Variance	0.265995
Coefficient of Variation	0.590776
Skewness	-0.587198

Gamma Statistics	
k hat	2.369293
k star (bias corrected)	1.08105
Theta hat	0.368464
Theta star	0.807548
nu hat	23.69293
nu star	10.8105
Approx.Chi Square Value (.05)	4.453552
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	2.85677

Log-transformed Statistics	
Minimum of log data	-1.687399
Maximum of log data	0.336472
Mean of log data	-0.361453
Standard Deviation of log data	0.849754
Variance of log data	0.722081

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

1.364708

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.904907
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.364708

Gamma Distribution Test	
A-D Test Statistic	0.449537
A-D 5% Critical Value	0.683778
K-S Test Statistic	0.320448
K-S 5% Critical Value	0.360082
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.119111
Adjusted Gamma UCL	3.30358

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.849238
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	6.125907
95% Chebyshev (MVUE) UCL	2.395421
97.5% Chebyshev (MVUE) UCL	3.034609
99% Chebyshev (MVUE) UCL	4.29017

95% Non-parametric UCLs	
CLT UCL	1.252384
Adj-CLT UCL (Adjusted for skewness)	1.187665
Mod-t UCL (Adjusted for skewness)	1.354613
Jackknife UCL	1.364708
Standard Bootstrap UCL	1.213167
Bootstrap-t UCL	1.329038
Hall's Bootstrap UCL	1.095092
Percentile Bootstrap UCL	1.22
BCA Bootstrap UCL	1.116
95% Chebyshev (Mean, Sd) UCL	1.878376
97.5% Chebyshev (Mean, Sd) UCL	2.313403
99% Chebyshev (Mean, Sd) UCL	3.167929

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TETRACHLOROETHENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.12
Maximum	3.3
Mean	1.124
Median	0.69
Standard Deviation	1.249012
Variance	1.56003
Coefficient of Variation	1.11122
Skewness	1.939247

Gamma Statistics	
k hat	1.147485
k star (bias corrected)	0.592327
Theta hat	0.979534
Theta star	1.8976
nu hat	11.47485
nu star	5.923273
Approx.Chi Square Value (.05)	1.600293
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.810188

Log-transformed Statistics	
Minimum of log data	-2.120264
Maximum of log data	1.193922
Mean of log data	-0.378395
Standard Deviation of log data	1.181613
Variance of log data	1.39621

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

Recommer 4.160339

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.760595
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.314796

Gamma Distribution Test	
A-D Test Statistic	0.36432
A-D 5% Critical Value	0.68988
K-S Test Statistic	0.26842
K-S 5% Critical Value	0.363602
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	4.160339
Adjusted Gamma UCL	8.217552

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.938856
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	39.86998
95% Chebyshev (MVUE) UCL	3.62704
97.5% Chebyshev (MVUE) UCL	4.700706
99% Chebyshev (MVUE) UCL	6.809715

95% Non-parametric UCLs	
CLT UCL	2.042774
Adj-CLT UCL (Adjusted for skewness)	2.560393
Mod-t UCL (Adjusted for skewness)	2.395534
Jackknife UCL	2.314796
Standard Bootstrap UCL	1.954589
Bootstrap-t UCL	4.782986
Hall's Bootstrap UCL	7.012184
Percentile Bootstrap UCL	2.128
BCA Bootstrap UCL	2.296
95% Chebyshev (Mean, Sd) UCL	3.558772
97.5% Chebyshev (Mean, Sd) UCL	4.6123
99% Chebyshev (Mean, Sd) UCL	6.681751

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TRICHLOROETHENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.12
Maximum	2.5
Mean	0.802
Median	0.48
Standard Deviation	0.961156
Variance	0.92382
Coefficient of Variation	1.198448
Skewness	2.092386

Gamma Statistics	
k hat	1.173574
k star (bias corrected)	0.602763
Theta hat	0.683383
Theta star	1.33054
nu hat	11.73574
nu star	6.027628
Approx.Chi Square Value (.05)	1.653501
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.844282

Log-transformed Statistics	
Minimum of log data	-2.120264
Maximum of log data	0.916291
Mean of log data	-0.703758
Standard Deviation of log data	1.07922
Variance of log data	1.164716

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Approximate Gamma UCL

Recommer 2.923589

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.691598
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.718357

Gamma Distribution Test	
A-D Test Statistic	0.55434
A-D 5% Critical Value	0.689622
K-S Test Statistic	0.368318
K-S 5% Critical Value	0.363459
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.923589
Adjusted Gamma UCL	5.725762

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.906706
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	15.03551
95% Chebyshev (MVUE) UCL	2.292334
97.5% Chebyshev (MVUE) UCL	2.953683
99% Chebyshev (MVUE) UCL	4.252775

95% Non-parametric UCLs	
CLT UCL	1.509027
Adj-CLT UCL (Adjusted for skewness)	1.938807
Mod-t UCL (Adjusted for skewness)	1.785394
Jackknife UCL	1.718357
Standard Bootstrap UCL	1.431995
Bootstrap-t UCL	10.36598
Hall's Bootstrap UCL	7.896395
Percentile Bootstrap UCL	1.62
BCA Bootstrap UCL	1.682
95% Chebyshev (Mean, Sd) UCL	2.675637
97.5% Chebyshev (Mean, Sd) UCL	3.486361
99% Chebyshev (Mean, Sd) UCL	5.078872

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: TRICHLOROFLUOROMETHANE (FREON 11)

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.28
Maximum	2.1
Mean	1.29
Median	1.5
Standard Deviation	0.692604
Variance	0.4797
Coefficient of Variation	0.536902
Skewness	-0.617742

Gamma Statistics	
k hat	2.761601
k star (bias corrected)	1.237974
Theta hat	0.46712
Theta star	1.042025
nu hat	27.61601
nu star	12.37974
Approx.Chi Square Value (.05)	5.47715
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	3.653474

Log-transformed Statistics	
Minimum of log data	-1.272966
Maximum of log data	0.741937
Mean of log data	0.062796
Standard Deviation of log data	0.796465
Variance of log data	0.634357

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

1.950322

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.966192
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.950322

Gamma Distribution Test	
A-D Test Statistic	0.408203
A-D 5% Critical Value	0.683064
K-S Test Statistic	0.276034
K-S 5% Critical Value	0.35967
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.915724
Adjusted Gamma UCL	4.371144

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.839909
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	7.328686
95% Chebyshev (MVUE) UCL	3.415962
97.5% Chebyshev (MVUE) UCL	4.306079
99% Chebyshev (MVUE) UCL	6.054543

95% Non-parametric UCLs	
CLT UCL	1.79948
Adj-CLT UCL (Adjusted for skewness)	1.708047
Mod-t UCL (Adjusted for skewness)	1.93606
Jackknife UCL	1.950322
Standard Bootstrap UCL	1.751796
Bootstrap-t UCL	1.782408
Hall's Bootstrap UCL	1.679186
Percentile Bootstrap UCL	1.754
BCA Bootstrap UCL	1.8
95% Chebyshev (Mean, Sd) UCL	2.640133
97.5% Chebyshev (Mean, Sd) UCL	3.224337
99% Chebyshev (Mean, Sd) UCL	4.371892

A-1.5 Indoor Air – West Parcel

Too Few Samples for UCL calculations

CDM

A-1.6 Indoor Air – South Parcel - Bishop

Too Few Samples for UCL calculations

CDM

A-1.7 Indoor Air – South Parcel – LA Carts/Oncology Care

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.092
Maximum	1.9
Mean	0.6924
Median	0.21
Standard Deviation	0.790739
Variance	0.625269
Coefficient of Variation	1.142027
Skewness	1.136976

Gamma Statistics	
k hat	0.910928
k star (bias corrected)	0.497705
Theta hat	0.760104
Theta star	1.391187
nu hat	9.109282
nu star	4.977046
Approx.Chi Square Value (.05)	1.141196
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.528276

Log-transformed Statistics	
Minimum of log data	-2.385967
Maximum of log data	0.641854
Mean of log data	-1.008406
Standard Deviation of log data	1.306087
Variance of log data	1.705864

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

1.446283

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.815801
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.446283

Gamma Distribution Test	
A-D Test Statistic	0.447126
A-D 5% Critical Value	0.693802
K-S Test Statistic	0.317805
K-S 5% Critical Value	0.365215
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	3.019732
Adjusted Gamma UCL	6.523304

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.899538
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	50.70774
95% Chebyshev (MVUE) UCL	2.273397
97.5% Chebyshev (MVUE) UCL	2.964058
99% Chebyshev (MVUE) UCL	4.320728

95% Non-parametric UCLs	
CLT UCL	1.274069
Adj-CLT UCL (Adjusted for skewness)	1.466199
Mod-t UCL (Adjusted for skewness)	1.476252
Jackknife UCL	1.446283
Standard Bootstrap UCL	1.211344
Bootstrap-t UCL	8.552351
Hall's Bootstrap UCL	10.01428
Percentile Bootstrap UCL	1.232
BCA Bootstrap UCL	1.392
95% Chebyshev (Mean, Sd) UCL	2.233835
97.5% Chebyshev (Mean, Sd) UCL	2.900815
99% Chebyshev (Mean, Sd) UCL	4.210968

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,1-DICHLOROETHENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.015
Maximum	0.92
Mean	0.3326
Median	0.058
Standard Deviation	0.413454
Variance	0.170944
Coefficient of Variation	1.243095
Skewness	0.890803

Gamma Statistics	
k hat	0.605008
k star (bias corrected)	0.375337
Theta hat	0.549744
Theta star	0.886138
nu hat	6.050084
nu star	3.753367
Approx.Chi Square Value (.05)	0.626486
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.250155

Log-transformed Statistics	
Minimum of log data	-4.199705
Maximum of log data	-0.083382
Mean of log data	-2.120833
Standard Deviation of log data	1.765285
Variance of log data	3.11623

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.726783

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.798694
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.726783

Gamma Distribution Test	
A-D Test Statistic	0.475315
A-D 5% Critical Value	0.705621
K-S Test Statistic	0.324176
K-S 5% Critical Value	0.369541
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.992655
Adjusted Gamma UCL	4.990376

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.896691
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	880.2982
95% Chebyshev (MVUE) UCL	1.372888
97.5% Chebyshev (MVUE) UCL	1.817139
99% Chebyshev (MVUE) UCL	2.689785

95% Non-parametric UCLs	
CLT UCL	0.636737
Adj-CLT UCL (Adjusted for skewness)	0.715445
Mod-t UCL (Adjusted for skewness)	0.739059
Jackknife UCL	0.726783
Standard Bootstrap UCL	0.598442
Bootstrap-t UCL	6.171837
Hall's Bootstrap UCL	7.277575
Percentile Bootstrap UCL	0.619
BCA Bootstrap UCL	0.6876
95% Chebyshev (Mean, Sd) UCL	1.138569
97.5% Chebyshev (Mean, Sd) UCL	1.487313
99% Chebyshev (Mean, Sd) UCL	2.172352

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,2-DICHLOROETHANE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.0135
Maximum	0.08
Mean	0.0482
Median	0.036
Standard Deviation	0.030225
Variance	0.000914
Coefficient of Variation	0.627083
Skewness	0.24233

Gamma Statistics	
k hat	2.715178
k star (bias corrected)	1.219405
Theta hat	0.017752
Theta star	0.039527
nu hat	27.15178
nu star	12.19405
Approx.Chi Square Value (.05)	5.354092
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	3.556605

Log-transformed Statistics	
Minimum of log data	-4.305066
Maximum of log data	-2.525729
Mean of log data	-3.227705
Standard Deviation of log data	0.74305
Variance of log data	0.552124

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.077017

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.855073
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.077017

Gamma Distribution Test	
A-D Test Statistic	0.386933
A-D 5% Critical Value	0.683148
K-S Test Statistic	0.265747
K-S 5% Critical Value	0.359719
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.109776
Adjusted Gamma UCL	0.165257

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.896951
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.216908
95% Chebyshev (MVUE) UCL	0.118635
97.5% Chebyshev (MVUE) UCL	0.148734
99% Chebyshev (MVUE) UCL	0.207858

95% Non-parametric UCLs	
CLT UCL	0.070434
Adj-CLT UCL (Adjusted for skewness)	0.071999
Mod-t UCL (Adjusted for skewness)	0.077261
Jackknife UCL	0.077017
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.10712
97.5% Chebyshev (Mean, Sd) UCL	0.132615
99% Chebyshev (Mean, Sd) UCL	0.182695

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,4-DICHLOROBENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.028
Maximum	0.08
Mean	0.0481
Median	0.036
Standard Deviation	0.023072
Variance	0.000532
Coefficient of Variation	0.47966
Skewness	0.774301

Gamma Statistics	
k hat	5.788545
k star (bias corrected)	2.448751
Theta hat	0.00831
Theta star	0.019643
nu hat	57.88545
nu star	24.48751
Approx.Chi Square Value (.05)	14.21826
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	10.95249

Log-transformed Statistics	
Minimum of log data	-3.575551
Maximum of log data	-2.525729
Mean of log data	-3.12333
Standard Deviation of log data	0.465272
Variance of log data	0.216478

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.070096

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.854032
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.070096

Gamma Distribution Test	
A-D Test Statistic	0.457403
A-D 5% Critical Value	0.680421
K-S Test Statistic	0.299474
K-S 5% Critical Value	0.358196
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.082841
Adjusted Gamma UCL	0.107542

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.879156
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.094925
95% Chebyshev (MVUE) UCL	0.09107
97.5% Chebyshev (MVUE) UCL	0.109736
99% Chebyshev (MVUE) UCL	0.1464

95% Non-parametric UCLs	
CLT UCL	0.065072
Adj-CLT UCL (Adjusted for skewness)	0.068889
Mod-t UCL (Adjusted for skewness)	0.070692
Jackknife UCL	0.070096
Standard Bootstrap UCL	0.063388
Bootstrap-t UCL	0.15276
Hall's Bootstrap UCL	0.243195
Percentile Bootstrap UCL	0.0636
BCA Bootstrap UCL	0.0682
95% Chebyshev (Mean, Sd) UCL	0.093075
97.5% Chebyshev (Mean, Sd) UCL	0.112536
99% Chebyshev (Mean, Sd) UCL	0.150762

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ACETONE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	31
Maximum	490
Mean	160.6
Median	42
Standard Deviation	197.1441
Variance	38865.8
Coefficient of Variation	1.227547
Skewness	1.642456

Gamma Statistics	
k hat	0.954252
k star (bias corrected)	0.515034
Theta hat	168.2994
Theta star	311.8241
nu hat	9.542517
nu star	5.15034
Approx.Chi Square Value (.05)	1.22186
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.575996

Log-transformed Statistics	
Minimum of log data	3.433987
Maximum of log data	6.194405
Mean of log data	4.470652
Standard Deviation of log data	1.21238
Variance of log data	1.469865

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

Recommer 676.9551

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.759677
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	348.5553

Gamma Distribution Test	
A-D Test Statistic	0.568208
A-D 5% Critical Value	0.692604
K-S Test Statistic	0.359525
K-S 5% Critical Value	0.364824
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	676.9551
Adjusted Gamma UCL	1436.025

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.840455
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	6259.005
95% Chebyshev (MVUE) UCL	481.8599
97.5% Chebyshev (MVUE) UCL	625.4871
99% Chebyshev (MVUE) UCL	907.6148

95% Non-parametric UCLs	
CLT UCL	305.6194
Adj-CLT UCL (Adjusted for skewness)	374.8165
Mod-t UCL (Adjusted for skewness)	359.3487
Jackknife UCL	348.5553
Standard Bootstrap UCL	292.1601
Bootstrap-t UCL	4716.388
Hall's Bootstrap UCL	3015.929
Percentile Bootstrap UCL	308.6
BCA Bootstrap UCL	342.4
95% Chebyshev (Mean, Sd) UCL	544.9046
97.5% Chebyshev (Mean, Sd) UCL	711.1935
99% Chebyshev (Mean, Sd) UCL	1037.836

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: BENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.36
Maximum	0.68
Mean	0.472
Median	0.42
Standard Deviation	0.129112
Variance	0.01667
Coefficient of Variation	0.273543
Skewness	1.34679

Gamma Statistics	
k hat	18.56292
k star (bias corrected)	7.558502
Theta hat	0.025427
Theta star	0.062446
nu hat	185.6292
nu star	75.58502
Approx.Chi Square Value (.05)	56.55684
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	49.42626

Log-transformed Statistics	
Minimum of log data	-1.021651
Maximum of log data	-0.385662
Mean of log data	-0.777953
Standard Deviation of log data	0.254473
Variance of log data	0.064756

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.595094

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.875586
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.595094

Gamma Distribution Test	
A-D Test Statistic	0.356191
A-D 5% Critical Value	0.678717
K-S Test Statistic	0.26097
K-S 5% Critical Value	0.357222
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.630801
Adjusted Gamma UCL	0.721805

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.917163
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.636089
95% Chebyshev (MVUE) UCL	0.704645
97.5% Chebyshev (MVUE) UCL	0.805594
99% Chebyshev (MVUE) UCL	1.003888

95% Non-parametric UCLs	
CLT UCL	0.566975
Adj-CLT UCL (Adjusted for skewness)	0.604135
Mod-t UCL (Adjusted for skewness)	0.600891
Jackknife UCL	0.595094
Standard Bootstrap UCL	0.555237
Bootstrap-t UCL	0.862941
Hall's Bootstrap UCL	1.162127
Percentile Bootstrap UCL	0.564
BCA Bootstrap UCL	0.612
95% Chebyshev (Mean, Sd) UCL	0.723686
97.5% Chebyshev (Mean, Sd) UCL	0.832591
99% Chebyshev (Mean, Sd) UCL	1.046514

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CARBON TETRACHLORIDE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.079
Maximum	0.083
Mean	0.0808
Median	0.08
Standard Deviation	0.001643
Variance	2.70E-06
Coefficient of Variation	0.020336
Skewness	0.518421

Gamma Statistics	
k hat	3034.697
k star (bias corrected)	1214.012
Theta hat	2.66E-05
Theta star	6.66E-05
nu hat	30346.97
nu star	12140.12
Approx.Chi Square Value (.05)	11884.9
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	11771.95

Log-transformed Statistics	
Minimum of log data	-2.538307
Maximum of log data	-2.488915
Mean of log data	-2.515943
Standard Deviation of log data	0.020276
Variance of log data	0.000411

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.082367

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.913508
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.082367

Gamma Distribution Test	
A-D Test Statistic	0.399327
A-D 5% Critical Value	0.67808
K-S Test Statistic	0.314759
K-S 5% Critical Value	0.35682
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.082535
Adjusted Gamma UCL	0.083327

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.914757
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	N/A
95% Chebyshev (MVUE) UCL	0.083994
97.5% Chebyshev (MVUE) UCL	0.085375
99% Chebyshev (MVUE) UCL	0.08809

95% Non-parametric UCLs	
CLT UCL	0.082009
Adj-CLT UCL (Adjusted for skewness)	0.082191
Mod-t UCL (Adjusted for skewness)	0.082395
Jackknife UCL	0.082367
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.084003
97.5% Chebyshev (Mean, Sd) UCL	0.085389
99% Chebyshev (Mean, Sd) UCL	0.088112

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CHLOROFORM

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.029
Maximum	0.14
Mean	0.089
Median	0.08
Standard Deviation	0.043046
Variance	0.001853
Coefficient of Variation	0.483668
Skewness	-0.295054

Gamma Statistics	
k hat	4.102538
k star (bias corrected)	1.774349
Theta hat	0.021694
Theta star	0.050159
nu hat	41.02538
nu star	17.74349
Approx.Chi Square Value (.05)	9.204384
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	6.686463

Log-transformed Statistics	
Minimum of log data	-3.540459
Maximum of log data	-1.966113
Mean of log data	-2.545917
Standard Deviation of log data	0.613971
Variance of log data	0.376961

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.13004

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.96078
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.13004

Gamma Distribution Test	
A-D Test Statistic	0.329065
A-D 5% Critical Value	0.681186
K-S Test Statistic	0.242682
K-S 5% Critical Value	0.358436
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.171567
Adjusted Gamma UCL	0.236174

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.887064
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.263702
95% Chebyshev (MVUE) UCL	0.198014
97.5% Chebyshev (MVUE) UCL	0.244392
99% Chebyshev (MVUE) UCL	0.335493

95% Non-parametric UCLs	
CLT UCL	0.120665
Adj-CLT UCL (Adjusted for skewness)	0.117951
Mod-t UCL (Adjusted for skewness)	0.129617
Jackknife UCL	0.13004
Standard Bootstrap UCL	0.118231
Bootstrap-t UCL	0.134875
Hall's Bootstrap UCL	0.144794
Percentile Bootstrap UCL	0.116
BCA Bootstrap UCL	0.124
95% Chebyshev (Mean, Sd) UCL	0.172913
97.5% Chebyshev (Mean, Sd) UCL	0.209222
99% Chebyshev (Mean, Sd) UCL	0.280545

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Ja Variable: DICHLORODIFLUOROMETHANE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.52
Maximum	0.68
Mean	0.606
Median	0.59
Standard Deviation	0.061887
Variance	0.00383
Coefficient of Variation	0.102124
Skewness	-0.270433

Gamma Statistics	
k hat	117.7533
k star (bias corrected)	47.23464
Theta hat	0.005146
Theta star	0.01283
nu hat	1177.533
nu star	472.3464
Approx.Chi Square Value (.05)	422.9425
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	402.2365

Log-transformed Statistics	
Minimum of log data	-0.653926
Maximum of log data	-0.385662
Mean of log data	-0.505127
Standard Deviation of log data	0.103626
Variance of log data	0.010738

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.665002

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.952743
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.665002

Gamma Distribution Test	
A-D Test Statistic	0.28694
A-D 5% Critical Value	0.67808
K-S Test Statistic	0.201903
K-S 5% Critical Value	0.35682
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.676787
Adjusted Gamma UCL	0.711626

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.946753
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.67432
95% Chebyshev (MVUE) UCL	0.728399
97.5% Chebyshev (MVUE) UCL	0.781351
99% Chebyshev (MVUE) UCL	0.885365

95% Non-parametric UCLs	
CLT UCL	0.651524
Adj-CLT UCL (Adjusted for skewness)	0.647948
Mod-t UCL (Adjusted for skewness)	0.664445
Jackknife UCL	0.665002
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.72664
97.5% Chebyshev (Mean, Sd) UCL	0.778841
99% Chebyshev (Mean, Sd) UCL	0.88138

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ETHYLBENZENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	4
Minimum	0.22
Maximum	0.47
Mean	0.284
Median	0.23
Standard Deviation	0.106911
Variance	0.01143
Coefficient of Variation	0.376448
Skewness	1.961629

Gamma Statistics	
k hat	10.93922
k star (bias corrected)	4.509021
Theta hat	0.025962
Theta star	0.062985
nu hat	109.3922
nu star	45.09021
Approx.Chi Square Value (.05)	30.6842
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	25.60276

Log-transformed Statistics	
Minimum of log data	-1.514128
Maximum of log data	-0.755023
Mean of log data	-1.305184
Standard Deviation of log data	0.323299
Variance of log data	0.104522

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Approximate Gamma UCL

0.417336

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.713615
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.385928

Gamma Distribution Test	
A-D Test Statistic	0.733752
A-D 5% Critical Value	0.678862
K-S Test Statistic	0.316058
K-S 5% Critical Value	0.35755
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.417336
Adjusted Gamma UCL	0.500166

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.757314
Shapiro-Wilk 5% Critical Value	0.762
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.424895
95% Chebyshev (MVUE) UCL	0.460085
97.5% Chebyshev (MVUE) UCL	0.536876
99% Chebyshev (MVUE) UCL	0.687716

95% Non-parametric UCLs	
CLT UCL	0.362644
Adj-CLT UCL (Adjusted for skewness)	0.407462
Mod-t UCL (Adjusted for skewness)	0.392919
Jackknife UCL	0.385928
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/R
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.492408
97.5% Chebyshev (Mean, Sd) UCL	0.582587
99% Chebyshev (Mean, Sd) UCL	0.759725

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: METHYLENE CHLORIDE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.315
Maximum	1.7
Mean	0.927
Median	0.8
Standard Deviation	0.649034
Variance	0.421245
Coefficient of Variation	0.700144
Skewness	0.297341

Gamma Statistics	
k hat	2.231141
k star (bias corrected)	1.02579
Theta hat	0.415483
Theta star	0.903694
nu hat	22.31141
nu star	10.2579
Approx.Chi Square Value (.05)	4.102727
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	2.589054

Log-transformed Statistics	
Minimum of log data	-1.155183
Maximum of log data	0.530628
Mean of log data	-0.316333
Standard Deviation of log data	0.810584
Variance of log data	0.657046

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

1.545783

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.862039
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.545783

Gamma Distribution Test	
A-D Test Statistic	0.450975
A-D 5% Critical Value	0.684029
K-S Test Statistic	0.266757
K-S 5% Critical Value	0.360227
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.317744
Adjusted Gamma UCL	3.672797

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.84833
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5.34426
95% Chebyshev (MVUE) UCL	2.381461
97.5% Chebyshev (MVUE) UCL	3.006092
99% Chebyshev (MVUE) UCL	4.233059

95% Non-parametric UCLs	
CLT UCL	1.40443
Adj-CLT UCL (Adjusted for skewness)	1.445671
Mod-t UCL (Adjusted for skewness)	1.552216
Jackknife UCL	1.545783
Standard Bootstrap UCL	1.34878
Bootstrap-t UCL	1.949311
Hall's Bootstrap UCL	1.334085
Percentile Bootstrap UCL	1.383
BCA Bootstrap UCL	1.3
95% Chebyshev (Mean, Sd) UCL	2.1922
97.5% Chebyshev (Mean, Sd) UCL	2.739653
99% Chebyshev (Mean, Sd) UCL	3.815019

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TETRACHLOROETHENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.0315
Maximum	0.24
Mean	0.0905
Median	0.065
Standard Deviation	0.085968
Variance	0.007391
Coefficient of Variation	0.949923
Skewness	1.938814

Gamma Statistics	
k hat	1.866208
k star (bias corrected)	0.879816
Theta hat	0.048494
Theta star	0.102862
nu hat	18.66208
nu star	8.798164
Approx.Chi Square Value (.05)	3.204762
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	1.919672

Log-transformed Statistics	
Minimum of log data	-3.457768
Maximum of log data	-1.427116
Mean of log data	-2.693643
Standard Deviation of log data	0.80861
Variance of log data	0.653849

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

Recommer 0.248453

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.752877
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.172461

Gamma Distribution Test	
A-D Test Statistic	0.440268
A-D 5% Critical Value	0.684969
K-S Test Statistic	0.266727
K-S 5% Critical Value	0.360791
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.248453
Adjusted Gamma UCL	0.414776

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.909436
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.491543
95% Chebyshev (MVUE) UCL	0.220432
97.5% Chebyshev (MVUE) UCL	0.278197
99% Chebyshev (MVUE) UCL	0.391664

95% Non-parametric UCLs	
CLT UCL	0.153738
Adj-CLT UCL (Adjusted for skewness)	0.189357
Mod-t UCL (Adjusted for skewness)	0.178017
Jackknife UCL	0.172461
Standard Bootstrap UCL	0.148408
Bootstrap-t UCL	0.308553
Hall's Bootstrap UCL	0.434494
Percentile Bootstrap UCL	0.1575
BCA Bootstrap UCL	0.173
95% Chebyshev (Mean, Sd) UCL	0.258083
97.5% Chebyshev (Mean, Sd) UCL	0.330596
99% Chebyshev (Mean, Sd) UCL	0.473034

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TOLUENE

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	2.8
Maximum	150
Mean	43.28
Median	4.4
Standard Deviation	63.64756
Variance	4051.012
Coefficient of Variation	1.4706
Skewness	1.668158

Gamma Statistics	
k hat	0.535049
k star (bias corrected)	0.347353
Theta hat	80.88974
Theta star	124.5994
nu hat	5.350493
nu star	3.473531
Approx.Chi Square Value (.05)	0.52529
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	0.202983

Log-transformed Statistics	
Minimum of log data	1.029619
Maximum of log data	5.010635
Mean of log data	2.592855
Standard Deviation of log data	1.79342
Variance of log data	3.216356

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

Recommer 286.1931

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.747911
Shapiro-Wilk 5% Critical Value	0.762
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	103.961

Gamma Distribution Test	
A-D Test Statistic	0.580305
A-D 5% Critical Value	0.709178
K-S Test Statistic	0.367224
K-S 5% Critical Value	0.370926
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	286.1931
Adjusted Gamma UCL	740.6269

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.829339
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	130030
95% Chebyshev (MVUE) UCL	158.8972
97.5% Chebyshev (MVUE) UCL	210.4543
99% Chebyshev (MVUE) UCL	311.7283

95% Non-parametric UCLs	
CLT UCL	90.0992
Adj-CLT UCL (Adjusted for skewness)	112.7889
Mod-t UCL (Adjusted for skewness)	107.5001
Jackknife UCL	103.961
Standard Bootstrap UCL	85.58052
Bootstrap-t UCL	3164.707
Hall's Bootstrap UCL	1830.689
Percentile Bootstrap UCL	91.44
BCA Bootstrap UCL	112
95% Chebyshev (Mean, Sd) UCL	167.3519
97.5% Chebyshev (Mean, Sd) UCL	221.038
99% Chebyshev (Mean, Sd) UCL	326.4938

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: TRICHLOROFLUOROMETHANE (FREON 11)

Raw Statistics	
Number of Valid Samples	5
Number of Unique Samples	5
Minimum	0.26
Maximum	0.57
Mean	0.396
Median	0.32
Standard Deviation	0.139032
Variance	0.01933
Coefficient of Variation	0.351092
Skewness	0.555685

Gamma Statistics	
k hat	10.49317
k star (bias corrected)	4.330602
Theta hat	0.037739
Theta star	0.091442
nu hat	104.9317
nu star	43.30602
Approx.Chi Square Value (.05)	29.21379
Adjusted Level of Significance	0.0086
Adjusted Chi Square Value	24.2709

Log-transformed Statistics	
Minimum of log data	-1.347074
Maximum of log data	-0.562119
Mean of log data	-0.974747
Standard Deviation of log data	0.345516
Variance of log data	0.119381

RECOMMENDATION

Data are normal (0.05)

Use Student's-t UCL

0.528552

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.852229
Shapiro-Wilk 5% Critical Value	0.762
Data are normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.528552

Gamma Distribution Test	
A-D Test Statistic	0.484391
A-D 5% Critical Value	0.678871
K-S Test Statistic	0.312856
K-S 5% Critical Value	0.357569
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.587024
Adjusted Gamma UCL	0.706574

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.875256
Shapiro-Wilk 5% Critical Value	0.762
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.61787
95% Chebyshev (MVUE) UCL	0.660933
97.5% Chebyshev (MVUE) UCL	0.775745
99% Chebyshev (MVUE) UCL	1.001272

95% Non-parametric UCLs	
CLT UCL	0.498272
Adj-CLT UCL (Adjusted for skewness)	0.514783
Mod-t UCL (Adjusted for skewness)	0.531127
Jackknife UCL	0.528552
Standard Bootstrap UCL	0.489329
Bootstrap-t UCL	0.905605
Hall's Bootstrap UCL	2.105572
Percentile Bootstrap UCL	0.49
BCA Bootstrap UCL	0.51
95% Chebyshev (Mean, Sd) UCL	0.667024
97.5% Chebyshev (Mean, Sd) UCL	0.784296
99% Chebyshev (Mean, Sd) UCL	1.014655

A-1.8 Soil Gas – South Parcel - Skateland

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	240
Maximum	330000
Mean	80204.29
Median	850
Standard Deviation	132107
Variance	1.75E+10
Coefficient of Variation	1.647132
Skewness	1.533694

Gamma Statistics	
k hat	0.264603
k star (bias corrected)	0.24644
Theta hat	303111.7
Theta star	325451.8
nu hat	3.704442
nu star	3.450158
Approx.Chi Square Value (.05)	0.517175
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.27288

Log-transformed Statistics	
Minimum of log data	5.480639
Maximum of log data	12.70685
Mean of log data	8.632502
Standard Deviation of log data	3.016715
Variance of log data	9.100569

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 1014061

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.695817
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	177230.7

Gamma Distribution Test	
A-D Test Statistic	0.691304
A-D 5% Critical Value	0.797204
K-S Test Statistic	0.337816
K-S 5% Critical Value	0.337497
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	535055.5
Adjusted Gamma UCL	1014061

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.837973
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.18E+11
95% Chebyshev (MVUE) UCL	492187.4
97.5% Chebyshev (MVUE) UCL	661056.1
99% Chebyshev (MVUE) UCL	992765.9

95% Non-parametric UCLs	
CLT UCL	162334.7
Adj-CLT UCL (Adjusted for skewness)	193262.4
Mod-t UCL (Adjusted for skewness)	182054.8
Jackknife UCL	177230.7
Standard Bootstrap UCL	153460.4
Bootstrap-t UCL	1006789
Hall's Bootstrap UCL	1453257
Percentile Bootstrap UCL	159835.7
BCA Bootstrap UCL	149934.3
95% Chebyshev (Mean, Sd) UCL	297851.8
97.5% Chebyshev (Mean, Sd) UCL	392028
99% Chebyshev (Mean, Sd) UCL	577019

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,1-DICHLOROETHENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	21
Maximum	210000
Mean	46487.29
Median	2100
Standard Deviation	77890.71
Variance	6.07E+09
Coefficient of Variation	1.675527
Skewness	1.987839

Gamma Statistics	
k hat	0.276612
k star (bias corrected)	0.253302
Theta hat	168059.3
Theta star	183524.9
nu hat	3.872573
nu star	3.546232
Approx.Chi Square Value (.05)	0.550874
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.292915

Log-transformed Statistics	
Minimum of log data	3.044522
Maximum of log data	12.25486
Mean of log data	8.220853
Standard Deviation of log data	3.255998
Variance of log data	10.60152

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 562807.9

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.697408
Shapiro-Wilk 5% Critical Value	0.803

Data not normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	103694.3

Gamma Distribution Test	
A-D Test Statistic	0.316661
A-D 5% Critical Value	0.792758
K-S Test Statistic	0.242205
K-S 5% Critical Value	0.33668

Data follow gamma distribution
at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	299260.5
Adjusted Gamma UCL	562807.9

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.947015
Shapiro-Wilk 5% Critical Value	0.803

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.23E+12
95% Chebyshev (MVUE) UCL	485392.5
97.5% Chebyshev (MVUE) UCL	652911.2
99% Chebyshev (MVUE) UCL	981969.3

95% Non-parametric UCLs	
CLT UCL	94911.64
Adj-CLT UCL (Adjusted for skewness)	118546.3
Mod-t UCL (Adjusted for skewness)	107380.9
Jackknife UCL	103694.3
Standard Bootstrap UCL	91651.68
Bootstrap-t UCL	317671.9
Hall's Bootstrap UCL	380058.5
Percentile Bootstrap UCL	98860.14
BCA Bootstrap UCL	92098.57
95% Chebyshev (Mean, Sd) UCL	174812.9
97.5% Chebyshev (Mean, Sd) UCL	230339.5
99% Chebyshev (Mean, Sd) UCL	339410.8

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 1,2,4-TRIMETHYLBENZENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.7
Maximum	950
Mean	194.4143
Median	5.5
Standard Deviation	354.5923
Variance	125735.7
Coefficient of Variation	1.8239
Skewness	2.113274

Gamma Statistics	
k hat	0.285162
k star (bias corrected)	0.258188
Theta hat	681.7679
Theta star	752.9956
nu hat	3.992268
nu star	3.614629
Approx.Chi Square Value (.05)	0.575404
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.307717

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	6.856462
Mean of log data	2.831756
Standard Deviation of log data	2.787792
Variance of log data	7.771782

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 2283.71

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.652126
Shapiro-Wilk 5% Critical Value	0.803

Data not normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	454.8456

Gamma Distribution Test	
A-D Test Statistic	0.507035
A-D 5% Critical Value	0.789593
K-S Test Statistic	0.290797
K-S 5% Critical Value	0.336099

Data follow gamma distribution
at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1221.29
Adjusted Gamma UCL	2283.71

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.913961
Shapiro-Wilk 5% Critical Value	0.803

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	31279201
95% Chebyshev (MVUE) UCL	1023.172
97.5% Chebyshev (MVUE) UCL	1371.686
99% Chebyshev (MVUE) UCL	2056.273

95% Non-parametric UCLs	
CLT UCL	414.863
Adj-CLT UCL (Adjusted for skewness)	529.2476
Mod-t UCL (Adjusted for skewness)	472.6873
Jackknife UCL	454.8456
Standard Bootstrap UCL	398.1859
Bootstrap-t UCL	2913.757
Hall's Bootstrap UCL	3385.239
Percentile Bootstrap UCL	417.3857
BCA Bootstrap UCL	409.5714
95% Chebyshev (Mean, Sd) UCL	778.6083
97.5% Chebyshev (Mean, Sd) UCL	1031.389
99% Chebyshev (Mean, Sd) UCL	1527.929

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 2,2,4-TRIMETHYLPENTANE

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	4.2
Maximum	335
Mean	72.11667
Median	11.5
Standard Deviation	130.8113
Variance	17111.6
Coefficient of Variation	1.813885
Skewness	2.293491

Gamma Statistics	
k hat	0.497943
k star (bias corrected)	0.360083
Theta hat	144.8291
Theta star	200.2781
nu hat	5.975318
nu star	4.320992
Approx.Chi Square Value (.05)	0.852135
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.429467

Log-transformed Statistics	
Minimum of log data	1.435085
Maximum of log data	5.814131
Mean of log data	3.001859
Standard Deviation of log data	1.676483
Variance of log data	2.810597

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 725.5864

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.61572
Shapiro-Wilk 5% Critical Value	0.788
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	179.7273

Gamma Distribution Test	
A-D Test Statistic	0.666145
A-D 5% Critical Value	0.736167
K-S Test Statistic	0.348947
K-S 5% Critical Value	0.348694
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	365.688
Adjusted Gamma UCL	725.5864

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.880069
Shapiro-Wilk 5% Critical Value	0.788
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	13668.69
95% Chebyshev (MVUE) UCL	209.7471
97.5% Chebyshev (MVUE) UCL	276.2763
99% Chebyshev (MVUE) UCL	406.9599

95% Non-parametric UCLs	
CLT UCL	159.9576
Adj-CLT UCL (Adjusted for skewness)	213.3859
Mod-t UCL (Adjusted for skewness)	188.061
Jackknife UCL	179.7273
Standard Bootstrap UCL	153.6617
Bootstrap-t UCL	2429.004
Hall's Bootstrap UCL	1299.84
Percentile Bootstrap UCL	171.8667
BCA Bootstrap UCL	226.0333
95% Chebyshev (Mean, Sd) UCL	304.8971
97.5% Chebyshev (Mean, Sd) UCL	405.6214
99% Chebyshev (Mean, Sd) UCL	603.4748

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 2-BUTANONE

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	0.7
Maximum	335
Mean	68.41667
Median	4.05
Standard Deviation	132.9702
Variance	17681.07
Coefficient of Variation	1.943535
Skewness	2.271768

Gamma Statistics	
k hat	0.325763
k star (bias corrected)	0.273992
Theta hat	210.0201
Theta star	249.7028
nu hat	3.909151
nu star	3.287909
Approx.Chi Square Value (.05)	0.462378
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.210483

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	5.814131
Mean of log data	2.137122
Standard Deviation of log data	2.368706
Variance of log data	5.610768

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 1068.72

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.614113
Shapiro-Wilk 5% Critical Value	0.788

Data not normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	177.8033

Gamma Distribution Test	
A-D Test Statistic	0.579251
A-D 5% Critical Value	0.762709
K-S Test Statistic	0.32735
K-S 5% Critical Value	0.355728

Data follow gamma distribution
at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	486.502
Adjusted Gamma UCL	1068.72

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.911376
Shapiro-Wilk 5% Critical Value	0.788

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3267899
95% Chebyshev (MVUE) UCL	242.0468
97.5% Chebyshev (MVUE) UCL	323.2909
99% Chebyshev (MVUE) UCL	482.8792

95% Non-parametric UCLs	
CLT UCL	157.7073
Adj-CLT UCL (Adjusted for skewness)	211.503
Mod-t UCL (Adjusted for skewness)	186.1943
Jackknife UCL	177.8033
Standard Bootstrap UCL	148.8971
Bootstrap-t UCL	4591.362
Hall's Bootstrap UCL	2366.681
Percentile Bootstrap UCL	168.65
BCA Bootstrap UCL	224.3667
95% Chebyshev (Mean, Sd) UCL	305.0388
97.5% Chebyshev (Mean, Sd) UCL	407.4254
99% Chebyshev (Mean, Sd) UCL	608.5441

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: 4-ETHYLTOLUENE

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	0.7
Maximum	335
Mean	68.38333
Median	3.95
Standard Deviation	132.99
Variance	17686.34
Coefficient of Variation	1.944772
Skewness	2.271548

Gamma Statistics	
k hat	0.324049
k star (bias corrected)	0.273136
Theta hat	211.0278
Theta star	250.3641
nu hat	3.888586
nu star	3.277627
Approx.Chi Square Value (.05)	0.458998
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.208791

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	5.814131
Mean of log data	2.123781
Standard Deviation of log data	2.376903
Variance of log data	5.649667

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 1073.492

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.614022
Shapiro-Wilk 5% Critical Value	0.788

Data not normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	177.7862

Gamma Distribution Test	
A-D Test Statistic	0.585202
A-D 5% Critical Value	0.762973
K-S Test Statistic	0.325818
K-S 5% Critical Value	0.355798

Data follow gamma distribution
at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	488.3134
Adjusted Gamma UCL	1073.492

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.90761
Shapiro-Wilk 5% Critical Value	0.788

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3521546
95% Chebyshev (MVUE) UCL	241.7699
97.5% Chebyshev (MVUE) UCL	322.9557
99% Chebyshev (MVUE) UCL	482.4295

95% Non-parametric UCLs	
CLT UCL	157.6873
Adj-CLT UCL (Adjusted for skewness)	211.4858
Mod-t UCL (Adjusted for skewness)	186.1777
Jackknife UCL	177.7862
Standard Bootstrap UCL	149.2465
Bootstrap-t UCL	4550.124
Hall's Bootstrap UCL	2755.485
Percentile Bootstrap UCL	168.4667
BCA Bootstrap UCL	200
95% Chebyshev (Mean, Sd) UCL	305.0408
97.5% Chebyshev (Mean, Sd) UCL	407.4427
99% Chebyshev (Mean, Sd) UCL	608.5913

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: ACETONE

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	35
Maximum	1350
Mean	306.3333
Median	70
Standard Deviation	518.7218
Variance	269072.3
Coefficient of Variation	1.693325
Skewness	2.30422

Gamma Statistics	
k hat	0.639699
k star (bias corrected)	0.43096
Theta hat	478.8713
Theta star	710.8154
nu hat	7.676384
nu star	5.171525
Approx.Chi Square Value (.05)	1.231835
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.671492

Log-transformed Statistics	
Minimum of log data	3.555348
Maximum of log data	7.20786
Mean of log data	4.767779
Standard Deviation of log data	1.393309
Variance of log data	1.941311

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

1286.058

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.616568
Shapiro-Wilk 5% Critical Value	0.788
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	733.0546

Gamma Distribution Test	
A-D Test Statistic	0.723847
A-D 5% Critical Value	0.727546
K-S Test Statistic	0.339183
K-S 5% Critical Value	0.345727
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1286.058
Adjusted Gamma UCL	2359.24

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.857213
Shapiro-Wilk 5% Critical Value	0.788
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	11161.26
95% Chebyshev (MVUE) UCL	823.1148
97.5% Chebyshev (MVUE) UCL	1073.333
99% Chebyshev (MVUE) UCL	1564.839

95% Non-parametric UCLs	
CLT UCL	654.6595
Adj-CLT UCL (Adjusted for skewness)	867.5164
Mod-t UCL (Adjusted for skewness)	766.256
Jackknife UCL	733.0546
Standard Bootstrap UCL	614.7376
Bootstrap-t UCL	7881.035
Hall's Bootstrap UCL	4170.173
Percentile Bootstrap UCL	701
BCA Bootstrap UCL	955.3333
95% Chebyshev (Mean, Sd) UCL	1229.405
97.5% Chebyshev (Mean, Sd) UCL	1628.82
99% Chebyshev (Mean, Sd) UCL	2413.391

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: BENZENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	1.15
Maximum	950
Mean	194.9071
Median	5.5
Standard Deviation	354.2816
Variance	125515.5
Coefficient of Variation	1.817694
Skewness	2.114983

Gamma Statistics	
k hat	0.307515
k star (bias corrected)	0.270961
Theta hat	633.8141
Theta star	719.3187
nu hat	4.305205
nu star	3.793451
Approx.Chi Square Value (.05)	0.641563
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.348462

Log-transformed Statistics	
Minimum of log data	0.139762
Maximum of log data	6.856462
Mean of log data	3.039177
Standard Deviation of log data	2.584493
Variance of log data	6.679604

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 2121.81

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.651693
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	455.1103

Gamma Distribution Test	
A-D Test Statistic	0.556536
A-D 5% Critical Value	0.782877
K-S Test Statistic	0.312809
K-S 5% Critical Value	0.334795
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1152.452
Adjusted Gamma UCL	2121.81

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.902976
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5193376
95% Chebyshev (MVUE) UCL	906.3395
97.5% Chebyshev (MVUE) UCL	1212.548
99% Chebyshev (MVUE) UCL	1814.036

95% Non-parametric UCLs	
CLT UCL	415.1627
Adj-CLT UCL (Adjusted for skewness)	529.5395
Mod-t UCL (Adjusted for skewness)	472.9508
Jackknife UCL	455.1103
Standard Bootstrap UCL	396.2452
Bootstrap-t UCL	2278.065
Hall's Bootstrap UCL	3382.39
Percentile Bootstrap UCL	418.3714
BCA Bootstrap UCL	409.25
95% Chebyshev (Mean, Sd) UCL	778.5893
97.5% Chebyshev (Mean, Sd) UCL	1031.149
99% Chebyshev (Mean, Sd) UCL	1527.254

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CARBON DISULFIDE

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	0.7
Maximum	335
Mean	68.58333
Median	4.55
Standard Deviation	132.8718
Variance	17654.91
Coefficient of Variation	1.937377
Skewness	2.272812

Gamma Statistics	
k hat	0.332873
k star (bias corrected)	0.277548
Theta hat	206.0344
Theta star	247.1046
nu hat	3.994479
nu star	3.330573
Approx.Chi Square Value (.05)	0.476522
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.217618

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	5.814131
Mean of log data	2.191359
Standard Deviation of log data	2.339788
Variance of log data	5.474608

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 1049.644

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.614561
Shapiro-Wilk 5% Critical Value	0.788

Data not normal at 5% significance level

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	177.889

Gamma Distribution Test	
A-D Test Statistic	0.557741
A-D 5% Critical Value	0.761613
K-S Test Statistic	0.333664
K-S 5% Critical Value	0.355437

Data follow gamma distribution
at 5% significance level

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	479.3523
Adjusted Gamma UCL	1049.644

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.923553
Shapiro-Wilk 5% Critical Value	0.788

Data are lognormal at 5% significance level

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2534619
95% Chebyshev (MVUE) UCL	244.7871
97.5% Chebyshev (MVUE) UCL	326.8247
99% Chebyshev (MVUE) UCL	487.9716

95% Non-parametric UCLs	
CLT UCL	157.8079
Adj-CLT UCL (Adjusted for skewness)	211.5884
Mod-t UCL (Adjusted for skewness)	186.2777
Jackknife UCL	177.889
Standard Bootstrap UCL	150.7951
Bootstrap-t UCL	4632.425
Hall's Bootstrap UCL	2054.859
Percentile Bootstrap UCL	168.9833
BCA Bootstrap UCL	189.45
95% Chebyshev (Mean, Sd) UCL	305.0304
97.5% Chebyshev (Mean, Sd) UCL	407.3412
99% Chebyshev (Mean, Sd) UCL	608.3111

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: CHLOROFORM

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.7
Maximum	950
Mean	194.3429
Median	5.5
Standard Deviation	354.6373
Variance	125767.6
Coefficient of Variation	1.824803
Skewness	2.113027

Gamma Statistics	
k hat	0.282604
k star (bias corrected)	0.256726
Theta hat	687.6852
Theta star	757.004
nu hat	3.956461
nu star	3.594168
Approx.Chi Square Value (.05)	0.56802
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.303242

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	6.856462
Mean of log data	2.80571
Standard Deviation of log data	2.807465
Variance of log data	7.88186

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 2303.442

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.652091
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	454.8073

Gamma Distribution Test	
A-D Test Statistic	0.515704
A-D 5% Critical Value	0.79054
K-S Test Statistic	0.288137
K-S 5% Critical Value	0.336273
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1229.712
Adjusted Gamma UCL	2303.442

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.908262
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	37293544
95% Chebyshev (MVUE) UCL	1029.319
97.5% Chebyshev (MVUE) UCL	1380.17
99% Chebyshev (MVUE) UCL	2069.35

95% Non-parametric UCLs	
CLT UCL	414.8196
Adj-CLT UCL (Adjusted for skewness)	529.2053
Mod-t UCL (Adjusted for skewness)	472.6491
Jackknife UCL	454.8073
Standard Bootstrap UCL	400.1701
Bootstrap-t UCL	2230.46
Hall's Bootstrap UCL	3376.007
Percentile Bootstrap UCL	425.0714
BCA Bootstrap UCL	408.7714
95% Chebyshev (Mean, Sd) UCL	778.611
97.5% Chebyshev (Mean, Sd) UCL	1031.424
99% Chebyshev (Mean, Sd) UCL	1528.027

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Ja Variable: DICHLORODIFLUOROMETHANE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	0.7
Maximum	1900
Mean	414.6714
Median	5.5
Standard Deviation	716.7619
Variance	513747.6
Coefficient of Variation	1.728506
Skewness	1.928891

Gamma Statistics	
k hat	0.259732
k star (bias corrected)	0.243657
Theta hat	1596.533
Theta star	1701.868
nu hat	3.636253
nu star	3.411192
Approx.Chi Square Value (.05)	0.503768
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.265013

Log-transformed Statistics	
Minimum of log data	-0.356675
Maximum of log data	7.549609
Mean of log data	3.30961
Standard Deviation of log data	3.118293
Variance of log data	9.72375

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 5337.573

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.683553
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	941.0992

Gamma Distribution Test	
A-D Test Statistic	0.548638
A-D 5% Critical Value	0.799007
K-S Test Statistic	0.318129
K-S 5% Critical Value	0.337828
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2807.886
Adjusted Gamma UCL	5337.573

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.887023
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.81E+09
95% Chebyshev (MVUE) UCL	2840.937
97.5% Chebyshev (MVUE) UCL	3818.274
99% Chebyshev (MVUE) UCL	5738.064

95% Non-parametric UCLs	
CLT UCL	860.2796
Adj-CLT UCL (Adjusted for skewness)	1071.32
Mod-t UCL (Adjusted for skewness)	974.0172
Jackknife UCL	941.0992
Standard Bootstrap UCL	811.2207
Bootstrap-t UCL	4311.064
Hall's Bootstrap UCL	5323.907
Percentile Bootstrap UCL	826.5
BCA Bootstrap UCL	816.6571
95% Chebyshev (Mean, Sd) UCL	1595.543
97.5% Chebyshev (Mean, Sd) UCL	2106.507
99% Chebyshev (Mean, Sd) UCL	3110.197

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: HEXANE (N-HEXANE)

Raw Statistics	
Number of Valid Samples	6
Number of Unique Samples	6
Minimum	1.15
Maximum	335
Mean	68.55833
Median	4.25
Standard Deviation	132.8849
Variance	17658.4
Coefficient of Variation	1.938275
Skewness	2.272794

Gamma Statistics	
k hat	0.340464
k star (bias corrected)	0.281343
Theta hat	201.3675
Theta star	243.6824
nu hat	4.085565
nu star	3.376116
Approx.Chi Square Value (.05)	0.491831
Adjusted Level of Significance	0.01222
Adjusted Chi Square Value	0.225431

Log-transformed Statistics	
Minimum of log data	0.139762
Maximum of log data	5.814131
Mean of log data	2.243711
Standard Deviation of log data	2.255588
Variance of log data	5.087679

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 1026.747

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.613191
Shapiro-Wilk 5% Critical Value	0.788
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	177.8748

Gamma Distribution Test	
A-D Test Statistic	0.64039
A-D 5% Critical Value	0.760443
K-S Test Statistic	0.33993
K-S 5% Critical Value	0.355127
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	470.6104
Adjusted Gamma UCL	1026.747

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.87751
Shapiro-Wilk 5% Critical Value	0.788
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1112094
95% Chebyshev (MVUE) UCL	227.6964
97.5% Chebyshev (MVUE) UCL	303.6419
99% Chebyshev (MVUE) UCL	452.8221

95% Non-parametric UCLs	
CLT UCL	157.7917
Adj-CLT UCL (Adjusted for skewness)	211.5772
Mod-t UCL (Adjusted for skewness)	186.2642
Jackknife UCL	177.8748
Standard Bootstrap UCL	146.5342
Bootstrap-t UCL	4729.711
Hall's Bootstrap UCL	2213.564
Percentile Bootstrap UCL	168.6917
BCA Bootstrap UCL	223.7167
95% Chebyshev (Mean, Sd) UCL	305.0288
97.5% Chebyshev (Mean, Sd) UCL	407.3497
99% Chebyshev (Mean, Sd) UCL	608.3394

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: M,P-XYLENES

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	3.2
Maximum	1900
Mean	331.5286
Median	7
Standard Deviation	702.043
Variance	492864.4
Coefficient of Variation	2.117594
Skewness	2.495518

Gamma Statistics	
k hat	0.291082
k star (bias corrected)	0.261571
Theta hat	1138.952
Theta star	1267.453
nu hat	4.07515
nu star	3.66199
Approx.Chi Square Value (.05)	0.592646
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.318223

Log-transformed Statistics	
Minimum of log data	1.163151
Maximum of log data	7.549609
Mean of log data	3.423053
Standard Deviation of log data	2.477939
Variance of log data	6.140184

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 3815.103

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.563285
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	847.146

Gamma Distribution Test	
A-D Test Statistic	0.752873
A-D 5% Critical Value	0.787401
K-S Test Statistic	0.319079
K-S 5% Critical Value	0.335696
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2048.531
Adjusted Gamma UCL	3815.103

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.851563
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2834652
95% Chebyshev (MVUE) UCL	1121.913
97.5% Chebyshev (MVUE) UCL	1499.034
99% Chebyshev (MVUE) UCL	2239.815

95% Non-parametric UCLs	
CLT UCL	767.9861
Adj-CLT UCL (Adjusted for skewness)	1035.414
Mod-t UCL (Adjusted for skewness)	888.8594
Jackknife UCL	847.146
Standard Bootstrap UCL	727.231
Bootstrap-t UCL	10154.45
Hall's Bootstrap UCL	10483.09
Percentile Bootstrap UCL	825.7429
BCA Bootstrap UCL	688.1429
95% Chebyshev (Mean, Sd) UCL	1488.151
97.5% Chebyshev (Mean, Sd) UCL	1988.622
99% Chebyshev (Mean, Sd) UCL	2971.701

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TETRACHLOROETHENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	140
Maximum	13000
Mean	3250
Median	1700
Standard Deviation	4561.517
Variance	20807433
Coefficient of Variation	1.403544
Skewness	2.069423

Gamma Statistics	
k hat	0.606144
k star (bias corrected)	0.441606
Theta hat	5361.764
Theta star	7359.502
nu hat	8.486013
nu star	6.182484
Approx.Chi Square Value (.05)	1.733304
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	1.116482

Log-transformed Statistics	
Minimum of log data	4.941642
Maximum of log data	9.472705
Mean of log data	7.068583
Standard Deviation of log data	1.718111
Variance of log data	2.951906

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Approximate Gamma UCL

11592.35

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.727212
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	6600.219

Gamma Distribution Test	
A-D Test Statistic	0.316923
A-D 5% Critical Value	0.745002
K-S Test Statistic	0.190311
K-S 5% Critical Value	0.325295
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	11592.35
Adjusted Gamma UCL	17996.77

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.92716
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	313277.7
95% Chebyshev (MVUE) UCL	13239.09
97.5% Chebyshev (MVUE) UCL	17420.71
99% Chebyshev (MVUE) UCL	25634.68

95% Non-parametric UCLs	
CLT UCL	6085.878
Adj-CLT UCL (Adjusted for skewness)	7526.801
Mod-t UCL (Adjusted for skewness)	6824.974
Jackknife UCL	6600.219
Standard Bootstrap UCL	5887.585
Bootstrap-t UCL	10710.39
Hall's Bootstrap UCL	16154.02
Percentile Bootstrap UCL	6372.857
BCA Bootstrap UCL	6172.857
95% Chebyshev (Mean, Sd) UCL	10765.14
97.5% Chebyshev (Mean, Sd) UCL	14016.95
99% Chebyshev (Mean, Sd) UCL	20404.49

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TOLUENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	5.5
Maximum	950
Mean	248.7571
Median	14
Standard Deviation	397.918
Variance	158338.7
Coefficient of Variation	1.599624
Skewness	1.368129

Gamma Statistics	
k hat	0.373951
k star (bias corrected)	0.308925
Theta hat	665.2124
Theta star	805.2357
nu hat	5.23532
nu star	4.324945
Approx.Chi Square Value (.05)	0.853792
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.485749

Log-transformed Statistics	
Minimum of log data	1.704748
Maximum of log data	6.856462
Mean of log data	3.737528
Standard Deviation of log data	2.171755
Variance of log data	4.716521

RECOMMENDATION

Assuming gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 2214.85

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.679277
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	541.0091

Gamma Distribution Test	
A-D Test Statistic	0.793013
A-D 5% Critical Value	0.772061
K-S Test Statistic	0.307451
K-S 5% Critical Value	0.332187
Data follow approximate gamma distibution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1260.097
Adjusted Gamma UCL	2214.85

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.830089
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	285000.5
95% Chebyshev (MVUE) UCL	948.0442
97.5% Chebyshev (MVUE) UCL	1260.86
99% Chebyshev (MVUE) UCL	1875.326

95% Non-parametric UCLs	
CLT UCL	496.1412
Adj-CLT UCL (Adjusted for skewness)	579.2416
Mod-t UCL (Adjusted for skewness)	553.9711
Jackknife UCL	541.0091
Standard Bootstrap UCL	477.3121
Bootstrap-t UCL	4491.506
Hall's Bootstrap UCL	6846.636
Percentile Bootstrap UCL	481.1429
BCA Bootstrap UCL	472.6429
95% Chebyshev (Mean, Sd) UCL	904.3306
97.5% Chebyshev (Mean, Sd) UCL	1187.998
99% Chebyshev (Mean, Sd) UCL	1745.207

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jar Variable: TRICHLOROETHENE

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	36
Maximum	7800
Mean	2538.143
Median	660
Standard Deviation	3523.529
Variance	12415255
Coefficient of Variation	1.388231
Skewness	1.161826

Gamma Statistics	
k hat	0.458803
k star (bias corrected)	0.357411
Theta hat	5532.1
Theta star	7101.466
nu hat	6.423239
nu star	5.003756
Approx.Chi Square Value (.05)	1.15352
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.691926

Log-transformed Statistics	
Minimum of log data	3.583519
Maximum of log data	8.961879
Mean of log data	6.435996
Standard Deviation of log data	2.131196
Variance of log data	4.541998

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 18354.91

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.704989
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	5126.009

Gamma Distribution Test	
A-D Test Statistic	0.384591
A-D 5% Critical Value	0.758247
K-S Test Statistic	0.196922
K-S 5% Critical Value	0.328857
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	11010
Adjusted Gamma UCL	18354.91

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.925457
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3074641
95% Chebyshev (MVUE) UCL	13223.13
97.5% Chebyshev (MVUE) UCL	17573.17
99% Chebyshev (MVUE) UCL	26117.99

95% Non-parametric UCLs	
CLT UCL	4728.707
Adj-CLT UCL (Adjusted for skewness)	5353.594
Mod-t UCL (Adjusted for skewness)	5223.478
Jackknife UCL	5126.009
Standard Bootstrap UCL	4582.155
Bootstrap-t UCL	16948.2
Hall's Bootstrap UCL	21842.29
Percentile Bootstrap UCL	4631.571
BCA Bootstrap UCL	4538.857
95% Chebyshev (Mean, Sd) UCL	8343.188
97.5% Chebyshev (Mean, Sd) UCL	10855.04
99% Chebyshev (Mean, Sd) UCL	15789.07

Data File P:\10500_OMEGA\HRA Oct 2006\Draft3 - Jan Variable: TRICHLOROFLUOROMETHANE (FREON 11)

Raw Statistics	
Number of Valid Samples	7
Number of Unique Samples	7
Minimum	98
Maximum	94000
Mean	22772.57
Median	620
Standard Deviation	37019.14
Variance	1.37E+09
Coefficient of Variation	1.625602
Skewness	1.585117

Gamma Statistics	
k hat	0.301878
k star (bias corrected)	0.26774
Theta hat	75436.34
Theta star	85054.86
nu hat	4.226292
nu star	3.748357
Approx.Chi Square Value (.05)	0.624611
Adjusted Level of Significance	0.01584
Adjusted Chi Square Value	0.337914

Log-transformed Statistics	
Minimum of log data	4.584967
Maximum of log data	11.45105
Mean of log data	7.751385
Standard Deviation of log data	2.731399
Variance of log data	7.460543

RECOMMENDATION

Data follow gamma distribution (0.05)

Use Adjusted Gamma UCL

Recommer 252608

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.705154
Shapiro-Wilk 5% Critical Value	0.803
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	49961.39

Gamma Distribution Test	
A-D Test Statistic	0.583738
A-D 5% Critical Value	0.783794
K-S Test Statistic	0.310322
K-S 5% Critical Value	0.335016
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	136660.6
Adjusted Gamma UCL	252608

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.882546
Shapiro-Wilk 5% Critical Value	0.803
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2.42E+09
95% Chebyshev (MVUE) UCL	127859.6
97.5% Chebyshev (MVUE) UCL	171320.6
99% Chebyshev (MVUE) UCL	256691.4

95% Non-parametric UCLs	
CLT UCL	45787.23
Adj-CLT UCL (Adjusted for skewness)	54744.39
Mod-t UCL (Adjusted for skewness)	51358.52
Jackknife UCL	49961.39
Standard Bootstrap UCL	44006.99
Bootstrap-t UCL	234968.7
Hall's Bootstrap UCL	329663.7
Percentile Bootstrap UCL	48114
BCA Bootstrap UCL	42438.29
95% Chebyshev (Mean, Sd) UCL	83761.94
97.5% Chebyshev (Mean, Sd) UCL	110152.1
99% Chebyshev (Mean, Sd) UCL	161990.4

Appendix A-2
USEPA Adult Lead Model

Table A2-1
Calculation of Lead
Exposure Using USEPA Adult Lead Model
Omega Chemical Site - Whittier, California

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1]		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
	1*	2**			GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	44.4	44.4	44.4	44.4
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.6**	**1.8**	**1.6**	**1.8**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**5.0**	**6.5**	**5.0**	**6.5**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.5%**	**1.6%**	**0.5%**	**1.6%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S.D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Appendix A-3
RAGS D Tables

TABLE A3-1.0
SELECTION OF EXPOSURE PATHWAYS
Omega Chemical Site - Whittier, California

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface Soil	Soil at Omega Site from 0' to 3'	Current Industrial Worker	Adult	Ingestion	Onsite	Quantitative	Current/future industrial workers may incidentally ingest surface soil
						Dermal	Onsite	Quantitative	Current/future industrial workers may come into contact with surface soil
						Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale soil particulates
				Construction Worker	Adult	Ingestion	Onsite	Quantitative	Current/future construction workers may incidentally ingest surface soil
						Dermal	Onsite	Quantitative	Current/future construction workers may come into contact with surface soil
						Inhalation	Onsite	Quantitative	Current/future construction workers may inhale surface soil particulates
		Subsurface Soil	Soil at Omega Site from 0' to 30'	Current Industrial Worker	Adult	Ingestion	Onsite	None	Current/future industrial workers are not expected to incidentally ingest subsurface soil
						Dermal	Onsite	None	Current/future industrial workers are not expected to come into contact with subsurface soil
						Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale subsurface soil particulates
				Construction Worker	Adult	Ingestion	Onsite	Quantitative	Current/future construction workers may incidentally ingest subsurface soil
						Dermal	Onsite	Quantitative	Current/future construction workers may come into contact with subsurface soil
						Inhalation	Onsite	Quantitative	Current/future construction workers may inhale subsurface soil particulates
		Soil Gas(1)	Ambient Air	Current Industrial Worker	Adult	Inhalation	Onsite	None	Current/future industrial workers are not expected to be exposed to soil gas in ambient air
				Construction Worker	Adult	Inhalation	Onsite	Qualitative - See Text	Current/future construction workers are not expected to be exposed to soil gas in ambient air
			Indoor Air(1)	Current Industrial Worker	Adult	Inhalation	Onsite	Quantitative	Current/future industrial workers may be exposed to soil gas in indoor air
	Groundwater	Groundwater	Groundwater in Drinking Water	Current Industrial Worker	Adult	Ingestion	Onsite	Qualitative - See Text	Current/future industrial workers are not expected to ingest groundwater from the site
						Dermal	Onsite	None	Current/future industrial workers are not expected to come into contact with groundwater from the site
						Inhalation	Onsite	None	Current/future industrial workers are not expected to inhale contaminants of groundwater origin
				Construction Worker	Adult	Ingestion	Onsite	None	Current/future construction workers are not expected to incidentally ingest groundwater
						Dermal	Onsite	None	Current/future construction workers are not expected to come into contact with groundwater
						Inhalation	Onsite	None	Current/future construction workers are not expected to inhale contaminants of groundwater origin
			Indoor Air(1) from Soil Gas of Groundwater Origin	Current Industrial Worker	Adult	Inhalation	Onsite	Qualitative - See Text	Current/future industrial workers may be exposed to groundwater migrating through soil gas into indoor air

(1) Note that indoor air was evaluated using 3 different sets of data - indoor air, soil gas, and groundwater - to see which set of data yields the most conservative results. Since these pathways all addresses the same pathway - inhalation of indoor air, only the most conservative results of these three pathways will be included in the total risks and hazards to prevent overrepresentation of this pathway in the total.

TABLE A3-2.1A - Parcel A
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface Soil
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil 0' to 3'
Exposure Medium:	Surface Soil 0' to 3'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Surface Soil															
	95-50-1	1,2-DICHLOROBENZENE	0.083	0.24	mg/kg	OC-SS-000-20-040604	2 / 20	0.09 - 8	0.24	NA	6.0E+01 sat			No	BSL
	123-91-1	1,4-DIOXANE	0.014	14	mg/kg	OC-SS-000-20-040604	10 / 19	0.03 - 0.2	14	NA	1.6E+01 ca			No	BSL
	91-57-6	2-METHYLNAPHTHALENE	0.48	0.48	mg/kg	OC-SS-000-20-040604	1 / 22	0.09 - 8	0.48	NA				Yes	NSL
	72-54-8	4,4'-DDD	0.0016	0.032	mg/kg	OC-SS-000-15-040504	2 / 22	0.0005 - 0.205	0.032	NA	1.0E+00 ca			No	BSL
	72-55-9	4,4'-DDE	0.001	0.3	mg/kg	OC-SS-000-15-040504	6 / 22	0.0005 - 0.205	0.3	NA	7.0E-01 ca			No	BSL
	50-29-3	4,4'-DDT	0.003	0.15	mg/kg	OC-SS-000-16-040504	6 / 22	0.0005 - 0.205	0.15	NA	7.0E-01 ca*			No	BSL
	7429-90-5	ALUMINUM	9585	9830	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	9830	NA	1.0E+04 max			No	BSL
	7440-36-0	ANTIMONY	0.6	0.9	mg/kg	OC-SS-000-17-040604, OC-SS-000-19-040604	8 / 22	6.7 - 10	0.9	NA	4.1E+01 nc			No	BSL
	7440-38-2	ARSENIC	3	21	mg/kg	OCSS-000-01-040504	22 / 22	1 - 1	21	NA	2.5E-02 ca			No	STAT
	7440-39-3	BARIUM	75	210	mg/kg	OC-SS-000-18-040604	22 / 22	1 - 1	210	NA	6.7E+03 nc			No	BSL
	56-55-3	BENZO(A)ANTHRACENE	0.032	0.032	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.032	NA	2.1E-01 ca			No	BSL
	7440-41-7	BERYLLIUM	0.18	0.52	mg/kg	OC-SS-000-20-040604	22 / 22	1 - 1	0.52	NA	1.9E+02 ca**			No	BSL
	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	mg/kg	OC-SS-000-20-040604	8 / 20	0.2 - 20	51	NA	1.2E+01 ca			Yes	ASL
	85-68-7	BUTYLBENZYL PHTHALATE	0.85	1.9	mg/kg	OCSS-000-01-040504	2 / 20	0.09 - 8	1.9	NA	1.0E+04 max			No	BSL
	7440-43-9	CADMIUM	0.25	2.1	mg/kg	OC1-000-04-S-0-5, OCSS-000-07-040504	22 / 22	1 - 1	2.1	NA	4.5E+01 nc			No	BSL
	7440-23-5	CALCIUM	6055	7170	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	7170	NA				No	NUT
	7440-47-3	CHROMIUM	7.11	308.6	mg/kg	OC-SS-000-09-040504	22 / 22	1 - 1	309	NA	4.5E+01 ca			Yes	ASL
	18540-29-9	CHROMIUM VI	1.19	51.4	mg/kg	OC-SS-000-09-040504	22 / 22	1 - 1	51.4	NA	6.4E+00 ca			Yes	ASL
	218-01-9	CHRYSENE	0.038	0.038	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.04	NA	2.1E+01 ca			No	BSL
	7440-48-4	COBALT	6.3	12	mg/kg	OCSS-000-03-040504	22 / 22	5 - 5	12.0	NA	1.9E+02 ca*			No	BSL
	7440-50-8	COPPER	13	35	mg/kg	OCSS-000-06-040504	22 / 22	2 - 2	35	NA	4.1E+03 nc			No	BSL
	60-57-1	DIELDRIN	0.0084	0.05	mg/kg	OC-SS-000-15-040504	2 / 22	0.0005 - 0.205	0.05	NA	1.1E-02 ca			Yes	ASL
	84-66-2	DIETHYL PHTHALATE	0.037	0.037	mg/kg	OC-SS-000-14-040504	1 / 20	0.09 - 8	0.037	NA	1.0E+04 max			No	BSL
	84-74-2	DI-N-BUTYLPHTHALATE	0.33	0.33	mg/kg	OC-SS-000-20-040604	1 / 20	0.09 - 8	0.33	NA	6.2E+03 nc			No	BSL
	72-20-8	ENDRIN	0.032	0.032	mg/kg	OC-SS-000-15-040504	1 / 22	0.0005 - 0.305	0.032	NA	1.8E+01 nc			No	BSL
	206-44-0	FLUORANTHENE (IDRYL)	0.033	0.033	mg/kg	OC-SS-000-09-040504	1 / 20	0.09 - 8	0.033	NA	2.2E+03 nc			No	BSL
	7439-89-6	IRON	22100.00	23200	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	23200	NA	1.0E+04 max			Yes	ASL
	7439-92-1	LEAD	5.00	100.0	mg/kg	OCSS-000-06-040504	22 / 22	5 - 5	100.0	NA	8.0E+01 nc			Yes	ASL
	7439-95-4	MAGNESIUM	5190	5575	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	5575	NA				No	NUT
	7439-96-5	MANGANESE	239	353	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	353	NA	1.9E+03 nc			No	BSL
	7487-94-7	MERCURY	0.029	0.85	mg/kg	OCSS-000-01-040504	20 / 22	0.11 - 0.2	0.85	NA	3.1E+01 nc			No	BSL
	7439-98-7	MOLYBDENUM	3	3	mg/kg	OCSS-000-08-040504	1 / 20	5 - 5	3	NA	5.1E+02 nc			No	BSL
	91-20-3	NAPHTHALENE	1.2	1.2	mg/kg	OC-SS-000-20-040604	1 / 22	0.09 - 8	1.2	NA	4.2E-01 ca			Yes	ASL
	7440-02-0	NICKEL	9.2	29.5	mg/kg	OC1-000-04-S-0-5	22 / 22	1 - 1	29.5	NA	2.0E+03 nc			No	BSL
	11097-69-1	PCB-1254 (AROCLOR 1254)	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 22	0.01 - 0.05	0.5	NA	7.4E-02 ca*			Yes	ASL

TABLE A3-2.1A - Parcel A
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface Soil
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil 0' to 3'
Exposure Medium:	Surface Soil 0' to 3'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	85-01-8	PHENANTHRENE	0.013	0.03	mg/kg	OC-SS-000-09-040504	2 / 20	0.09 - 8	0.03	NA				Yes	NSL
	12674-11-2	POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 20	0.01 - 0.02	0.5	NA	2.1E+00 ca**			No	BSL
	7440-09-7	POTASSIUM	4350	4520	mg/kg	OC1-000-12-S-0-7	2 / 2	NR - NR	4520	NA				No	NUT
	129-00-0	PYRENE	0.018	0.044	mg/kg	OC-SS-000-09-040504	2 / 20	0.09 - 8	0.044	NA	2.9E+03 nc			No	BSL
	7440-22-4	SILVER	0.56	1.2	mg/kg	OCSS-000-06-040504	3 / 22	1 - 1	1.2	NA	5.1E+02 nc			No	BSL
	7440-23-5	SODIUM	290	320	mg/kg	OC1-000-04-S-0-5	2 / 2	NR - NR	320	NA				No	NUT
	7440-28-0	THALLIUM	0.9	2	mg/kg	OCSS-000-02-040504[2]	14 / 22	2.8 - 10	2	NA	6.7E+00 nc			No	BSL
	7440-62-2	VANADIUM	20	52.5	mg/kg	OCSS-000-08-040504	22 / 22	1 - 1	52.5	NA	1.0E+02 nc			No	BSL
	7440-66-6	ZINC	34	160	mg/kg	OCSS-000-07-040504	22 / 22	5 - 5	160	NA	1.0E+04 max			No	BSL

(1) Detection limits for detected chemicals in historical data were not available.
(2) Maximum detected concentration used for screening.
(3) Maximum detected background concentration.
(4) Screened against 1/10th EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c) to account for additivity of multiple chemcials.
(5) Not available.
(6) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
(7) Rationale Codes:

Selection Reason:
ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason:
BSL: Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
IFD: Infrequent Detection
STAT: Not a site contaminant according to separate statistical analysis, see text

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered.
VOCs: Volatile Organic Compounds.
ug/kg: microgram per kilogram.
ca*: where: nc PRG < 100X ca PRG
ca**: where nc PRG < 10X ca PRG

TABLE A3-2.2A - Parcel Site
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface and Subsurface Soil
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface & Subsurface Soil to 30'
Exposure Medium:	Surface & Subsurface Soil to 30'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Subsurface Soil															
	71-55-6	1,1,1-TRICHLOROETHANE	0.00097	1200	mg/kg	SB-9-5.9-SOIL-12/13/1995	20 / 64	0.00083 - 30	1200	NA	1.2E+02 sat			Yes	ASL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.0072	590	mg/kg	SB-9-5.9-SOIL-12/13/1995	10 / 64	0.005 - 100	590	NA	5.6E+02 sat			Yes	ASL
	79-00-5	1,1,2-TRICHLOROETHANE	0.0034	0.011	mg/kg	MIP3-B2-30	6 / 64	0.0008 - 50	0.011	NA	1.6E-01 ca*			No	BSL
	75-34-3	1,1-DICHLOROETHANE	0.0036	0.013	mg/kg	MIP3-B2-30	6 / 64	0.0008 - 50	0.013	NA	6.0E-01 ca			No	BSL
	75-35-4	1,1-DICHLOROETHENE	0.0019	60	mg/kg	SB-9-1.8-SOIL-12/13/1995	16 / 64	0.0008 - 50	60	NA	4.1E+01 nc			Yes	ASL
	95-50-1	1,2-DICHLOROBENZENE	0.00088	0.24	mg/kg	OC-SS-000-20-040604	3 / 84	0.00083 - 50	0.24	NA	6.0E+01 sat			No	BSL1
	107-06-2	1,2-DICHLOROETHANE	0.0032	1.6	mg/kg	SUMP-0.5-SOIL-9/12/96	8 / 64	0.0008 - 50	1.6	NA	6.0E-02 ca*			Yes	ASL
	106-46-7	1,4-DICHLOROBENZENE	0.0016	0.0016	mg/kg	MIP3-B2-05	1 / 84	0.0008 - 50	0.0016	NA	7.9E-01 ca			No	BSL1
	123-91-1	1,4-DIOXANE	0.014	41	mg/kg	MIP3-B2-15	18 / 35	0.025 - 2.5	41	NA	1.6E+01 ca			Yes	ASL
	91-57-6	2-METHYLNAPHTHALENE	0.48	0.54	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 40	0.09 - 8	0.54	NA				Yes	NSL
	72-54-8	4,4'-DDD	0.0015	0.032	mg/kg	OC-SS-000-15-040504	3 / 40	0.0005 - 0.205	0.032	NA	1.0E+00 ca			No	BSL
	72-55-9	4,4'-DDE	0.001	0.3	mg/kg	OC-SS-000-15-040504	6 / 22	0.0005 - 0.205	0.3	NA	7.0E-01 ca			No	BSL
	50-29-3	4,4'-DDT	0.003	0.15	mg/kg	OC-SS-000-16-040504	6 / 22	0.0005 - 0.205	0.15	NA	7.0E-01 ca*			No	BSL
	67-64-1	ACETONE	34	34	mg/kg	SUMP-5-SOIL-9/12/96	1 / 64	0.0081 - 1000	34	NA	5.4E+03 nc			No	BSL1
	7429-90-5	ALUMINUM	9585	9830	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	9830	NA	1.0E+04 max			No	BSL
	7440-36-0	ANTIMONY	0.6	18	mg/kg	SB-13-1.8-SOIL-12/12/1995	10 / 40	6.7 - 10	18	NA	4.1E+01 nc			No	BSL
	7440-38-2	ARSENIC	0.81	21	mg/kg	OCSS-000-01-040504	40 / 40	1 - 1	21	NA	2.5E-02 ca			No	STAT
	7440-39-3	BARIUM	28	230	mg/kg	SB-13-1.8-SOIL-12/12/1995	40 / 40	1 - 1	230	NA	6.7E+03 nc			No	BSL
	71-43-2	BENZENE	0.0019	0.0019	mg/kg	MIP3-B2-30	1 / 64	0.00083 - 50	0.0019	NA	1.4E-01 ca*			No	BSL1
	56-55-3	BENZO(A)ANTHRACENE	0.032	2.4	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	2.4	NA	2.1E-01 ca			Yes	ASL
	50-32-8	BENZO(A)PYRENE	1.6	1.6	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	1.6	NA	2.1E-02 ca			Yes	ASL
	205-99-2	BENZO(B)FLUORANTHENE	0.91	0.91	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	0.91	NA	2.1E-01 ca			Yes	ASL
	191-24-2	BENZO(G,H,I)PERYLENE	0.49	0.49	mg/kg	SB-15-1.7-SOIL-12/11/1995	1 / 38	0.09 - 8	0.49	NA				No	NTX1
	100-51-6	BENZYL ALCOHOL (PHENYLMETHANOL)	5.2	22	mg/kg	SB-9-5.9-SOIL-12/13/1995	2 / 38	0.09 - 8	22	NA	1.0E+04 max			No	BSL
	7440-41-7	BERYLLIUM	0.18	0.75	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	1 - 1	0.75	NA	1.9E+02 ca**			No	BSL
	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.03	51	mg/kg	OC-SS-000-20-040604	13 / 38	0.2 - 20	51	NA	1.2E+01 ca			Yes	ASL
	75-25-2	BROMOFORM	0.013	0.013	mg/kg	MIP3-B2-15	1 / 64	0.004 - 50	0.013	NA	2.2E+01 ca*			No	BSL1
	85-68-7	BUTYLBENZYL PHTHALATE	0.85	1.9	mg/kg	OCSS-000-01-040504	2 / 38	0.09 - 8	1.9	NA	1.0E+04 max			No	BSL
	7440-43-9	CADMIUM	0.25	2.1	mg/kg	OC1-000-04-S-0-5, OCSS-000-07-040504	22 / 40	0.5 - 1	2.1	NA	4.5E+01 nc			No	BSL
	7440-23-5	CALCIUM	6055	7170	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	7170	NA				No	NUT
	67-66-3	CHLOROFORM	0.0014	0.013	mg/kg	MIP3-B2-30	10 / 64	0.0008 - 50	0.013	NA	2.0E-01 ca			No	BSL
	7440-47-3	CHROMIUM	5.6	360	mg/kg	OC-SS-000-09-040504	40 / 40	1 - 1	360	NA	4.5E+01 ca			Yes	ASL
	16065-83-1	CHROMIUM III	4.8	309	mg/kg		0 / 0	0 - 0	309	NA	1.0E+04 max			No	BSL
	18540-29-9	CHROMIUM VI	0.8	51.4	mg/kg	OC-SS-000-09-040504	40 / 40	-	51.4	NA	6.4E+00 ca			Yes	ASL
	218-01-9	CHRYSENE	0.038	6	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	6	NA	2.1E+01 ca			No	BSL
	156-59-2	CIS-1,2-DICHLOROETHENE	0.00096	0.0018	mg/kg	OC-SB-GP6-MIP-25-012204	2 / 64	0.00083 - 50	0.0018	NA	1.5E+01 nc			No	BSL1
	7440-48-4	COBALT	4.7	16	mg/kg	SB-12-1.7-SOIL-12/11/1995	39 / 40	4 - 5	16	NA	1.9E+02 ca*			No	BSL
	7440-50-8	COPPER	13	150	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	2 - 2	150	NA	4.1E+03 nc			No	BSL
	60-57-1	DIELDRIN	0.0084	0.05	mg/kg	OC-SS-000-15-040504	2 / 40	0.0005 - 0.205	0.05	NA	1.1E-02 ca			Yes	ASL
	84-66-2	DIETHYL PHTHALATE	0.037	0.037	mg/kg	OC-SS-000-14-040504	1 / 38	0.09 - 8	0.037	NA	1.0E+04 max			No	BSL1
	84-74-2	DI-N-BUTYLPHTHALATE	0.33	0.33	mg/kg	OC-SS-000-20-040604	1 / 38	0.09 - 8	0.33	NA	6.2E+03 nc			No	BSL1
	117-84-0	DI-N-OCTYL PHTHALATE (DIOCTYL PHTHALATE)	0.24	0.24	mg/kg	SB-11-1.8-SOIL-12/14/1995	1 / 38	0.09 - 8	0.24	NA	2.5E+03 nc			No	BSL1
	72-20-8	ENDRIN	0.032	0.032	mg/kg	OC-SS-000-15-040504	1 / 40	0.0005 - 0.305	0.032	NA	1.8E+01 nc			No	BSL1
	206-44-0	FLUORANTHENE (IDRYL)	0.033	0.66	mg/kg	SB-15-1.7-SOIL-12/11/1995	2 / 38	0.09 - 8	0.66	NA	2.2E+03 nc			No	BSL
	7439-89-6	IRON	22100	23200	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	23200	NA	1.0E+04 max			Yes	ASL
	78-59-1	ISOPHORONE	0.54	9.9	mg/kg	SB-9-1.8-SOIL-12/13/1995	3 / 40	0.09 - 8	9.9	NA	5.1E+01 ca*			No	BSL
	7439-92-1	LEAD	5	890	mg/kg	SB-12-1.7-SOIL-12/11/1995	39 / 40	5 - 5	890	NA	8.0E+01 nc			Yes	ASL
	7439-95-4	MAGNESIUM	5190	5575	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	5575	NA				No	NUT
	7439-96-5	MANGANESE	239	353	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	353	NA	1.9E+03 nc			No	BSL
	7487-94-7	MERCURY	0.029	0.85	mg/kg	OCSS-000-01-040504	21 / 40	0.1 - 0.2	0.85	NA	3.1E+01 nc			No	BSL
	75-09-2	METHYLENE CHLORIDE	59	100	mg/kg	SB-9-5.9-SOIL-12/13/1995	2 / 64	0.005 - 50	100	NA	2.1E+00 ca			Yes	ASL
	7439-98-7	MOLYBDENUM	1.5	4.2	mg/kg	SB-13-1.8-SOIL-12/12/1995	17 / 38	1 - 5	4.2	NA	5.1E+02 nc			No	BSL
	91-20-3	NAPHTHALENE	1.2	1.2	mg/kg	OC-SS-000-20-040604	1 / 56	0.004 - 8	1.2	NA	4.2E-01 ca			Yes	ASL

TABLE A3-2.2A - Parcel Site
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Surface and Subsurface Soil
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface & Subsurface Soil to 30'
Exposure Medium:	Surface & Subsurface Soil to 30'

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (nc/ca) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (5)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	7440-02-0	NICKEL	4.9	55	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	1 - 1	55	NA	2.0E+03 nc			No	BSL
	11097-69-1	PCB-1254 (AROCLOR 1254)	0.052	0.5	mg/kg	OC-SS-000-16-040504	3 / 40	0.01 - 0.06	0.5	NA	7.4E-02 ca*			Yes	ASL
	85-01-8	PHENANTHRENE	0.013	5	mg/kg	SB-15-1.7-SOIL-12/11/1995	3 / 38	0.09 - 8	5	NA				Yes	NSL
	12674-11-2	POLYCHLORINATED BI PHENYLS, TOTAL	0.5	0.5	mg/kg	OC-SS-000-16-040504	1 / 20	0.01 - 0.02	0.5	NA	2.1E+00 ca**			No	BSL
	7440-09-7	POTASSIUM	4350	4520	mg/kg	OC1-000-12-S-0-7	2 / 2	0 - 0	4520	NA				No	NUT
	129-00-0	PYRENE	0.018	3.1	mg/kg	SB-15-1.7-SOIL-12/11/1995	3 / 38	0.09 - 8	3.1	NA	2.9E+03 nc			No	BSL
	7440-22-4	SILVER	0.56	1.2	mg/kg	OCSS-000-06-040504	3 / 40	1 - 1	1.2	NA	5.1E+02 nc			No	BSL
	7440-23-5	SODIUM	290	320	mg/kg	OC1-000-04-S-0-5	2 / 2	0 - 0	320	NA				No	NUT
	127-18-4	TETRACHLOROETHENE	0.0091	1300	mg/kg	SB-9-1.8-SOIL-12/13/1995	63 / 64	0.001 - 0.1	1300	NA	1.3E-01 ca			Yes	ASL
	7440-28-0	THALLIUM	0.9	2	mg/kg	OCSS-000-02-0405043	14 / 40	2.8 - 10	2	NA	6.7E+00 nc			No	BSL
	108-88-3	TOLUENE	62	62	mg/kg	SB-9-5.9-SOIL-12/13/1995	1 / 64	0.00083 - 50	62	NA	5.2E+01 sat			Yes	ASL
	1330-20-7	TOTAL XYLENES	0.1	0.1	mg/kg	C-3-30-SOIL-2/1/96	1 / 51	0.0032 - 200	0.1	NA	4.2E+01 sat			No	BSL1
	156-60-5	TRANS-1,2-DICHLOROETHENE	0.0048	0.0103	mg/kg	MIP1-B3-29	2 / 64	0.0008 - 50	0.0103	NA	2.3E+01 nc			No	BSL1
	10061-02-6	TRANS-1,3-DICHLOROPROPENE	0.024	0.024	mg/kg	C-3-15-SOIL-2/1/96	1 / 64	0.0016 - 50	0.024	NA				No	IFD
	79-01-6	TRICHLOROETHENE	0.0032	140	mg/kg	SB-9-5.9-SOIL-12/13/1995	21 / 64	0.001 - 50	140	NA	6.5E-01 ca			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.017	220	mg/kg	SB-9-5.9-SOIL-12/13/1995	6 / 64	0.004 - 50	220	NA	2.0E+02 sat			Yes	ASL
	7440-62-2	VANADIUM	20	71	mg/kg	SB-5-1.8-SOIL-12/11/1995	40 / 40	1 - 1	71	NA	1.0E+02 nc			No	BSL
	108-05-4	VINYL ACETATE	0.05	0.05	mg/kg	C-3-15-SOIL-2/1/96	1 / 59	0.0083 - 500	0.05	NA	1.4E+02 nc			No	BSL1
	7440-66-6	ZINC	34	350	mg/kg	SB-12-1.7-SOIL-12/11/1995	40 / 40	5 - 5	350	NA	1.0E+04 max			No	BSL

(1) Detection limits for detected chemicals in historical data were not available.
(2) Maximum detected concentration used for screening.
(3) Maximum detected background concentration.
(4) Screened against 1/10th EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c) to account for additivity of multiple chemcials.
(5) Not available.
(6) Chromium concentrations were divided between Chromium III and Chromium VI assuming a 1:6 ratio of Cr VI:Cr III
(7) Rationale Codes:

Selection Reason:
ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason:
BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
BSL2: Below ARAR/TBC in absence of Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection
STAT: Not a site contaminant according to separate statistical analysis, see text

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
VOCs: Volatile Organic Compounds.
ug/kg: microgram per kilogram.
ca*: where: nc PRG < 100X ca PRG
ca**: where nc PRG < 10X ca PRG

TABLE A3-2.3A - Parcel Site
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	71-55-6	1,1,1-TRICHLOROETHANE	0.038	0.06	ppbv	OC-IA-FS-07-091405	3 / 8	0.027 - 4.6	6.0E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.21	3.9	ppbv	OC-AA-FD-07-051104	7 / 8	0.027 - 4.6	3.9E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.17	4.4	ppbv	OC-AA-FD-07-051104	7 / 8	0.027 - 4.6	4.4E+00	NA				Yes	NSL
	67-64-1	ACETONE	10	2500	ppbv	OC-IA-FD-09-091405	8 / 8	0.013 - 4.6	2.5E+03	NA				Yes	NSL
	71-43-2	BENZENE	0.81	3.5	ppbv	OC-IA-FS-14-091405	6 / 8	2.000 - 4.6	3.5E+00	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.091	0.11	ppbv	OC-IA-FS-07-091405	5 / 8	2.000 - 4.6	1.1E-01	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.039	0.05	ppbv	OC-AA-FS-13-051104	2 / 8	0.027 - 4.6	5.0E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.28	0.62	ppbv	OC-IA-FS-14-091405	6 / 8	0.027 - 4.6	6.2E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.73	11	ppbv	OC-AA-FS-09-051104	7 / 8	0.027 - 4.6	1.1E+01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	3.3	61	ppbv	OC-AA-FS-09-051104	7 / 8	0.670 - 84	6.1E+01	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.43	74	ppbv	OC-IA-FS-14-091405	6 / 8	0.067 - 8.4	7.4E+01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.66	18	ppbv	OC-AA-FS-09-051104	7 / 8	0.027 - 4.6	1.8E+01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	0.15	5.1	ppbv	OC-IA-FS-07-091405	7 / 8	0.027 - 4.6	5.1E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	8.9	620	ppbv	OC-AA-FS-09-051104	8 / 8	0.027 - 4.6	6.2E+02	NA	1.2E+02			Yes	ASL
	79-01-6	TRICHLOROETHENE	0.046	1.2	ppbv	OC-IA-FS-07-091405	6 / 8	2.000 - 4.6	1.2E+00	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.35	2.4	ppbv	OC-AA-FD-07-051104	6 / 8	0.027 - 4.6	2.4E+00	NA				Yes	NSL

(1) Maximum detected concentration from samples located parallel to the current dry cleaning factility used for screening.
(2) Maximum detected background concentration.
(3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^3: microgram per cubic meter.

TABLE A3-2.3B - Parcel North
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	71-55-6	1,1,1-TRICHLOROETHANE	0.038	0.038	ppbv	OC-AA-FS-10-051104	1 / 5	0.032 - 0.24	3.8E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.25	5.1	ppbv	OC-AA-FS-10-051104	5 / 5	0.032 - 0.24	5.1E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.74	2.6	ppbv	OC-AA-FS-10-091405	4 / 5	0.016 - 0.12	2.6E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.034	0.15	ppbv	OC-AA-FS-10-051104	2 / 5	0.032 - 0.24	1.5E-01	NA				Yes	NSL
	67-64-1	ACETONE	9.1	1400	ppbv	OC-AA-FS-10-051104	5 / 5	0.800 - 6	1.4E+03	NA				Yes	NSL
	71-43-2	BENZENE	0.28	0.33	ppbv	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4 / 5	0.080 - 0.6	3.3E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.1	0.13	ppbv	OC-AA-FS-10-091405, OC-AA-FS-11-051104	4 / 5	0.032 - 0.24	1.3E-01	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.041	0.066	ppbv	OC-AA-FS-11-091405	3 / 5	0.032 - 0.24	6.6E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.25	0.66	ppbv	OC-AA-FS-10-051104	5 / 5	0.032 - 0.24	6.6E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.17	0.19	ppbv	OC-AA-FS-10-051104	4 / 5	0.032 - 0.24	1.9E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.49	0.62	ppbv	OC-AA-FS-10-091405	4 / 5	0.064 - 0.48	6.2E-01	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.48	1.4	ppbv	OC-AA-FS-10-051104	3 / 5	0.320 - 2.4	1.4E+00	NA				Yes	NSL
	95-47-6	O-XYLENE	0.2	0.23	ppbv	OC-AA-FS-10-051104	4 / 5	0.032 - 0.24	2.3E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	0.62	3.3	ppbv	OC-AA-FS-10-091405	4 / 5	0.032 - 0.24	3.3E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	0.73	2	ppbv	OC-AA-FS-10-091405	5 / 5	0.032 - 0.24	2.0E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.42	2.5	ppbv	OC-AA-FS-10-091405	4 / 5	0.032 - 0.24	2.5E+00	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.25	2.1	ppbv	OC-AA-FS-10-091405	5 / 5	0.032 - 0.24	2.1E+00	NA				Yes	NSL

(1) Maximum detected concentration from samples located parallel to the current dry cleaning factility used for screening.
(2) Maximum detected background concentration.
(3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^3: microgram per cubic meter.

TABLE A3-2.3C - Parcel West
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	71-55-6	1,1,1-TRICHLOROETHANE	0.082	0.088	ppbv	OC-AA-FS-06-051104	2 / 4	0.032 - 0.037	8.8E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.83	3.4	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	3.4E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	1.4	5.7	ppbv	OC-AA-FS-05-051104	4 / 4	0.016 - 0.018	5.7E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.038	0.045	ppbv	OC-IA-FD-05-091405	2 / 4	0.032 - 0.037	4.5E-02	NA				Yes	NSL
	67-64-1	ACETONE	9.2	18	ppbv	OC-AA-FS-06-051104	4 / 4	0.790 - 0.92	1.8E+01	NA				Yes	NSL
	71-43-2	BENZENE	0.36	0.45	ppbv	OC-AA-FS-06-051104	4 / 4	0.079 - 0.092	4.5E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.087	0.11	ppbv	OC-IA-FD-05-091405	4 / 4	0.032 - 0.037	1.1E-01	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.042	0.048	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	4.8E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.3	0.58	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	5.8E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.21	0.36	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	3.6E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.75	1.2	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.063 - 0.073	1.2E+00	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.35	0.43	ppbv	OC-AA-FS-05-051104	4 / 4	0.320 - 0.37	4.3E-01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.22	0.47	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.032 - 0.037	4.7E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	5.7	15	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	1.5E+01	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	1.7	2.6	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	2.6E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.3	0.8	ppbv	OC-AA-FS-05-051104	4 / 4	0.032 - 0.037	8.0E-01	NA	3.8E-01			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.61	1.2	ppbv	-FS-05-051104,OC-AA-FS-06-	4 / 4	0.032 - 0.037	1.2E+00	NA				Yes	NSL

(1) Maximum detected concentration from samples located parallel to the current dry cleaning factility used for screening.
(2) Maximum detected background concentration.
(3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^3: microgram per cubic meter.

TABLE A3-2.3D - Parcel South - Bishop
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	71-55-6	1,1,1-TRICHLOROETHANE	0.036	0.036	ppbv	OC-IA-BIS-STORE-090806	1 / 3	0.030 - 0.062	3.6E-02	NA	5.9E+02			No	BSL
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.44	1.3	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	1.3E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.9	3.6	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.015 - 0.031	3.6E+00	NA				Yes	NSL
	106-46-7	1,4-DICHLOROBENZENE	0.036	0.053	ppbv	OC-IA-BIS-AO-090806	2 / 3	0.030 - 0.062	5.3E-02	NA				Yes	NSL
	67-64-1	ACETONE	12	17.35	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.740 - 1.6	1.7E+01	NA				Yes	NSL
	71-43-2	BENZENE	0.355	0.39	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.074 - 0.16	3.9E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.081	0.091	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.030 - 0.062	9.1E-02	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.032	0.036	ppbv	OC-IA-BIS-STORE-090806	2 / 3	0.030 - 0.062	3.6E-02	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.55	0.605	ppbv	OC-IA-BIS-AO-090806	3 / 3	0.030 - 0.062	6.1E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.19	0.4	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	4.0E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.615	1.1	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.060 - 0.12	1.1E+00	NA	2.3E+02			No	BSL
	1634-04-4	METHYL TERT-BUTYL ETHER	0.19	0.19	ppbv	OC-IA-BIS-STORE-090806	1 / 3	0.150 - 0.31	1.9E-01	NA	4.4E+00			No	BSL
	75-09-2	METHYLENE CHLORIDE	0.29	0.49	ppbv	OC-IA-BIS-STORE-090806	2 / 3	0.300 - 0.62	4.9E-01	NA				Yes	NSL
	95-47-6	O-XYLENE	0.23	0.39	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	3.9E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	1	4.3	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	4.3E+00	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	1.8	2.2	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	2.2E+00	NA	1.2E+02			No	BSL
	79-01-6	TRICHLOROETHENE	0.083	0.28	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	2.8E-01	NA	3.8E-01			No	BSL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.39	0.65	ppbv	OC-IA-BIS-STORE-090806	3 / 3	0.030 - 0.062	6.5E-01	NA				Yes	NSL

(1) Maximum detected concentration from samples located parallel to the current dry cleaning factility used for screening.
(2) Maximum detected background concentration.
(3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^{3}: microgram per cubic meter.

TABLE A3-2.3E - Parcel South - LA Carts/Oncology Care
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Indoor Air
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Indoor Air
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.092	1.9	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	1.9E+00	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	0.015	0.92	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.013 - 0.082	9.2E-01	NA				Yes	NSL
	107-06-2	1,2-DICHLOROETHANE	0.08	0.08	ppbv	OC-IA-ONC-NS-090806	1 / 5	0.027 - 0.16	8.0E-02	NA	4.8E-02			Yes	ASL
	106-46-7	1,4-DICHLOROBENZENE	0.028	0.065	ppbv	OC-IA-ONC-NS-090806	2 / 5	0.027 - 0.16	6.5E-02	NA				Yes	NSL
	67-64-1	ACETONE	31	490	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.670 - 4.1	4.9E+02	NA				Yes	NSL
	71-43-2	BENZENE	0.36	0.68	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.067 - 0.41	6.8E-01	NA	4.4E-02			Yes	ASL
	56-23-5	CARBON TETRACHLORIDE	0.079	0.083	ppbv	OC-IA-ONC-AO-090806	4 / 5	0.027 - 0.16	8.3E-02	NA	1.5E-02			Yes	ASL
	67-66-3	CHLOROFORM	0.029	0.14	ppbv	OC-IA-ONC-AO-090806	4 / 5	0.027 - 0.16	1.4E-01	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	0.52	0.68	ppbv	OC-IA-ONC-NS-090806	5 / 5	0.027 - 0.16	6.8E-01	NA				Yes	NSL
	100-41-4	ETHYLBENZENE	0.22	0.47	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.027 - 0.16	4.7E-01	NA	0.0E+00			Yes	ASL
		M,P-XYLENES	0.67	1.7	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.054 - 0.33	1.7E+00	NA	2.3E+02			No	BSL
	75-09-2	METHYLENE CHLORIDE	1.5	1.7	ppbv	OC-IA-LAC-Lg Prod-090806	2 / 5	0.270 - 1.6	1.7E+00	NA				Yes	NSL
	95-47-6	O-XYLENE	0.24	0.59	ppbv	OC-IA-LAC-Lg Prod-090806	5 / 5	0.027 - 0.16	5.9E-01	NA	2.3E+02			No	BSL
	127-18-4	TETRACHLOROETHENE	0.036	0.24	ppbv	OC-IA-LAC-Lg Prod-090806	3 / 5	0.027 - 0.16	2.4E-01	NA	1.0E-01			Yes	ASL
	108-88-3	TOLUENE	2.8	150.0	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	1.5E+02	NA	1.2E+02			Yes	ASL
	79-01-6	TRICHLOROETHENE	0.22	0.22	ppbv	OC-IA-LAC-AO-090806	1 / 5	0.027 - 0.16	2.2E-01	NA	3.8E-01			No	BSL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	0.26	0.57	ppbv	OC-IA-LAC-Sm Prod-090806	5 / 5	0.027 - 0.16	5.7E-01	NA				Yes	NSL

(1) Maximum detected concentration from samples located parallel to the current dry cleaning factility used for screening.
(2) Maximum detected background concentration.
(3) Screened against CalEPA's CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^3: microgram per cubic meter.

TABLE A3-2.4 - Parcel South - Skateland
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - Soil Gas
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limts	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (nc/ca) (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source (4)	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil Gas															
	76-13-1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	240	330000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	3.3E+05	NA				Yes	NSL
	75-35-4	1,1-DICHLOROETHENE	21	210000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	2.1E+05	NA				Yes	NSL
	95-63-6	1,2,4-TRIMETHYLBENZENE	3	3	ppbv	UC-4B	1 / 7	1.4 - 1900	3.0E+00	NA				Yes	NSL
		2,2,4-TRIMETHYLPENTANE	4.2	12	ppbv	UC-10	3 / 6	1.4 - 670	1.2E+01	NA				Yes	NSL
	78-93-3	2-BUTANONE	2.6	2.6	ppbv	UC-4B	1 / 6	1.4 - 670	2.6E+00	NA				Yes	NSL
		4-ETHYLTOLUENE	2.4	2.4	ppbv	UC-4B	1 / 6	1.4 - 670	2.4E+00	NA				Yes	NSL
	67-64-1	ACETONE	35	78	ppbv	SG-15-6FT	4 / 6	5.8 - 2700	7.8E+01	NA				Yes	NSL
	71-43-2	BENZENE	2.6	5.1	ppbv	SG-15-6FT	2 / 7	1.4 - 1900	5.1E+00	NA	3.8E+01			No	BSL
	75-15-0	CARBON DISULFIDE	3.6	3.6	ppbv	UC-4B	1 / 6	1.4 - 670	3.6E+00	NA				Yes	NSL
	67-66-3	CHLOROFORM	2.5	2.5	ppbv	UC-4B	1 / 7	1.4 - 1900	2.5E+00	NA				Yes	NSL
	75-71-8	DICHLORODIFLUOROMETHANE	2.8	1900	ppbv	OC1-SG14A-G-0-28	5 / 7	1.4 - 670	1.9E+03	NA				Yes	NSL
	110-54-3	HEXANE (N-HEXANE)	3	3	ppbv	UC-10	1 / 6	1.4 - 670	3.0E+00	NA				Yes	NSL
		M,P-XYLENES	3.2	7	ppbv	SG-15-6FT	3 / 7	1.4 - 3800	7.0E+00	NA	2.0E+05			No	BSL
	127-18-4	TETRACHLOROETHENE	140	13000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	1.3E+04	NA	8.9E+01			Yes	ASL
	108-88-3	TOLUENE	7.8	690	ppbv	SG-14-6FT	4 / 7	1.4 - 1900	6.9E+02	NA	1.0E+05			No	BSL
	79-01-6	TRICHLOROETHENE	36	7800	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	7.8E+03	NA	3.3E+02			Yes	ASL
	75-69-4	TRICHLOROFLUOROMETHANE (FREON 11)	98	94000	ppbv	OC1-SG14A-G-0-28	7 / 7	1.4 - 670	9.4E+04	NA				Yes	NSL

(1) Maximum detected concentration from onsite samples
(2) Maximum detected background concentration.
(3) Screened against EPA's Shallow Soil Gas Screening Levels for Human Health (Vapor Intrusion) for Commercial/Industrial Use (EPA 2005).
(4) Rationale Codes:

Selection Reason: ASL: Above Screening Level
TOX: Chemical is a Class A Carcinogen
DET: Relatively few chemicals detected at site, so comparison with screening levels and frequency of detection were not used to eliminate COPCs
NSL: No Screening Level

Deletion Reason: BSL: Below Screening Level
BSL1: Infrequent Detection and Below Screening Level
BSL2: Below ARAR/TBC in absence of Screening Level
NUT: Essential Nutrient
NTX: No Toxicity Information Available
NTX1: Infrequent Detection and No Toxicity Information Available
IFD: Infrequent Detection

Definitions:
NA: Not Available.
ND: Not Detected.
nc: Screening Toxicity Value is based on noncancer effects.
ca: Screening Toxicity Value is based on cancer effects.
COPC: Chemical of Potential Concern.
ARAR/TBC: Applicable or Relevant and Appropriate Requirement/To Be Considered
ug/m^3: microgram per cubic meter.

TABLE A3-3.1A - Parcel Site

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations			
						Value	Units	Statistic (2)	Rationale
Surface Soil									
	2-METHYLNAPHTHALENE	mg/kg	0.72	3.3	0.48	0.48	mg/kg	Max	UCL is greater than Max
	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.5	19.4	51	19.4	mg/kg	95% UCL-T	
	CHROMIUM	mg/kg	38.1	98.9	308.6	98.9	mg/kg	UCL-NP	
	CHROMIUM VI	mg/kg	6.4	16.5	51.4	16.5	mg/kg	UCL-NP	
	DIELDRIN	mg/kg	0.006	0.016	0.05	0.016	mg/kg	UCL-NP	
	IRON	mg/kg	22,650.0	NO UCL	23200	23200	mg/kg	Max	UCL is greater than Max
	LEAD	mg/kg	32.2	44.4	100	44.4	mg/kg	95% UCL-G	
	NAPHTHALENE	mg/kg	0.75	3.4	1.2	1.2	mg/kg	Max	UCL is greater than Max
	PCB-1254 (AROCLOR 1254)	mg/kg	0.03	0.25	0.50	0.25	mg/kg	UCL-NP	
	PHENANTHRENE	mg/kg	0.75	3.6	0.03	0.03	mg/kg	Max	UCL is greater than Max

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

mg/kg: milligram per kilogram.

TABLE A3-3.2A - Parcel Site

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Future
Medium:	Surface/Subsurface Soil
Exposure Medium:	Surface/Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL of Distribution [1]	Maximum Detected Concentration	Exposure Point Concentrations			
						Value	Units	Statistic [2]	Rationale
Surface/Subsurface									
	1,1,1-TRICHLOROETHANE	mg/kg	33.6	264	1,200	264	mg/kg	UCL-NP	
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	mg/kg	16.8	125	590	125	mg/kg	UCL-NP	
	1,1-DICHLOROETHENE	mg/kg	2.09	12.6	60.0	12.6	mg/kg	UCL-NP	
	1,2-DICHLOROETHANE	mg/kg	1.60	8.44	1.6	1.60	mg/kg	Max	UCL is greater than Max
	1,4-DIOXANE	mg/kg	2.69	15.9	41.0	15.9	mg/kg	UCL-NP	
	2-METHYLNAPHTHALENE	mg/kg	0.45	1.84	0.54	0.54	mg/kg	Max	UCL is greater than Max
	BENZO(A)ANTHRACENE	mg/kg	0.51	2.08	2.4	2.08	mg/kg	UCL-NP	
	BENZO(A)PYRENE	mg/kg	0.49	2.01	1.6	1.60	mg/kg	Max	UCL is greater than Max
	BENZO(B)FLUORANTHENE	mg/kg	0.47	1.97	0.91	0.91	mg/kg	Max	UCL is greater than Max
	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	2.72	15.3	51.0	15.3	mg/kg	UCL-NP	
	CHROMIUM	mg/kg	36.9	77.2	360	77.2	mg/kg	UCL-NP	
	CHROMIUM VI	mg/kg	5.27	11.0	51.4	11.0	mg/kg	UCL-NP	
	DIELDRIN	mg/kg	0.007	0.035	0.05	0.035	mg/kg	UCL-NP	
	IRON	mg/kg	22,925	23,579	23,200	23,200	mg/kg	Max	UCL is greater than Max
	LEAD	mg/kg	48.1	54	890	54	mg/kg	95% UCL-T	
	METHYLENE CHLORIDE	mg/kg	3.26	21	100	21	mg/kg	UCL-NP	
	NAPHTHALENE	mg/kg	0.34	0.99	1.2	0.99	mg/kg	UCL-NP	
	PCB-1254 (AROCLOR 1254)	mg/kg	0.028	0.081	0.5	0.081	mg/kg	UCL-NP	
	PHENANTHRENE	mg/kg	0.56	2.39	5.00	2.39	mg/kg	UCL-NP	
	TETRACHLOROETHENE	mg/kg	51.6	317	1300	317	mg/kg	UCL-NP	
	TOLUENE	mg/kg	2.13	13.1	62.0	13.1	mg/kg	UCL-NP	
	TRICHLOROETHENE	mg/kg	4.40	30	140	30	mg/kg	UCL-NP	
	TRICHLOROFLUOROMETHANE (FREON 11)	mg/kg	6.55	47	220	47	mg/kg	UCL-NP	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ND: Not detected.

mg/kg: milligram per kilogram.

TABLE A3-3.3A - Parcel Site
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations (2)					
						Value	Units	Converted Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	1.3	2.2	3.9	2.2	ppbv	16.9	ug/m^3	95% UCL-N	
	1,1-DICHLOROETHENE	ppbv	1.7	2.8	4.4	2.8	ppbv	15.5	ug/m^3	95% UCL-N	
	ACETONE	ppbv	672.9	4,540	2,500	2,500	ppbv	5,939	ug/m^3	Max	UCL is greater than Max
	BENZENE	ppbv	1.9	3.1	3.50	3.1	ppbv	9.7	ug/m^3	95% UCL-G	
	CARBON TETRACHLORIDE	ppbv	0.3	2.3	0.11	0.11	ppbv	0.69	ug/m^3	Max	UCL is greater than Max
	CHLOROFORM	ppbv	0.3	1.3	0.05	0.05	ppbv	0.24	ug/m^3	Max	UCL is greater than Max
	DICHLORODIFLUOROMETHANE	ppbv	0.6	1.0	0.62	0.62	ppbv	3.07	ug/m^3	Max	UCL is greater than Max
	ETHYLBENZENE	ppbv	2.8	5.9	11	5.9	ppbv	25.6	ug/m^3	95% UCL-G	
	METHYLENE CHLORIDE	ppbv	13.9	77.7	74	74	ppbv	257	ug/m^3	Max	UCL is greater than Max
	TETRACHLOROETHENE	ppbv	1.7	2.7	5.1	2.7	ppbv	18.4	ug/m^3	95% UCL-N	
	TOLUENE	ppbv	104.8	525.4	620	525	ppbv	1,980	ug/m^3	95% UCL-G assumed	
	TRICHLOROETHENE	ppbv	0.6	1.0	1.2	0.99	ppbv	5.32	ug/m^3	95% UCL-N	
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	1.1	1.6	2.4	1.6	ppbv	9.0	ug/m^3	95% UCL-N	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: http://www.airtoxics.com/cclasses/unitcalc.html.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3B - Parcel North
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations (2)					
						Value	Units	Converted Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	3.3	5.3	5.1	5.1	ppbv	39	ug/m^3	Max	UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	1.3	2.2	2.6	2.2	ppbv	8.7	ug/m^3	95% UCL-N	
	1,4-DICHLOROBENZENE	ppbv	0.07	0.13	0.15	0.13	ppbv	0.78	ug/m^3	95% UCL-N	
	ACETONE	ppbv	365	6,982	1400	1400	ppbv	3,326	ug/m^3	Max	UCL is greater than Max
	BENZENE	ppbv	0.31	0.33	0.33	0.33	ppbv	1.1	ug/m^3	Max	UCL is greater than Max
	CARBON TETRACHLORIDE	ppbv	0.14	0.17	0.13	0.13	ppbv	0.82	ug/m^3	Max	UCL is greater than Max
	CHLOROFORM	ppbv	0.07	0.10	0.066	0.066	ppbv	0.34	ug/m^3	Max	UCL is greater than Max
	DICHLORODIFLUOROMETHANE	ppbv	0.46	0.61	0.66	0.61	ppbv	3.0	ug/m^3	95% UCL-N	
	ETHYLBENZENE	ppbv	0.17	0.19	0.19	0.19	ppbv	0.82	ug/m^3	Max	UCL is greater than Max
	METHYLENE CHLORIDE	ppbv	0.87	1.4	1.4	1.4	ppbv	4.9	ug/m^3	95% UCL-N	
	TETRACHLOROETHENE	ppbv	1.1	4.2	3.3	3.3	ppbv	22	ug/m^3	Max	UCL is greater than Max
	TRICHLOROETHENE	ppbv	0.80	2.92	2.5	2.5	ppbv	13	ug/m^3	Max	UCL is greater than Max
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	1.3	2.0	2.1	2.0	ppbv	11	ug/m^3	95% UCL-N	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: http://www.airtoxics.com/cclasses/unitcalc.html.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3C - Parcel West
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations (2)					
						Value	Units	Converted Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	1.88	No UCL	3.40	3.40	ppbv	26.1	ug/m^3	Max	Too Few Samples for UCL
	1,1-DICHLOROETHENE	ppbv	3.10	No UCL	5.70	5.70	ppbv	22.6	ug/m^3	Max	Too Few Samples for UCL
	1,4-DICHLOROBENZENE	ppbv	0.025	No UCL	0.05	0.05	ppbv	0.30	ug/m^3	Max	Too Few Samples for UCL
	ACETONE	ppbv	11.1	No UCL	18	18	ppbv	42.8	ug/m^3	Max	Too Few Samples for UCL
	BENZENE	ppbv	0.31	No UCL	0.45	0.45	ppbv	1.44	ug/m^3	Max	Too Few Samples for UCL
	CARBON TETRACHLORIDE	ppbv	0.074	No UCL	0.11	0.11	ppbv	0.69	ug/m^3	Max	Too Few Samples for UCL
	CHLOROFORM	ppbv	0.034	No UCL	0.05	0.05	ppbv	0.24	ug/m^3	Max	Too Few Samples for UCL
	DICHLORODIFLUOROMETHANE	ppbv	0.38	No UCL	0.58	0.58	ppbv	2.87	ug/m^3	Max	Too Few Samples for UCL
	ETHYLBENZENE	ppbv	0.23	No UCL	0.36	0.36	ppbv	1.56	ug/m^3	Max	Too Few Samples for UCL
	METHYLENE CHLORIDE	ppbv	0.29	No UCL	0.43	0.43	ppbv	1.49	ug/m^3	Max	Too Few Samples for UCL
	TETRACHLOROETHENE	ppbv	8.68	No UCL	15	15	ppbv	102	ug/m^3	Max	Too Few Samples for UCL
	TRICHLOROETHENE	ppbv	0.46	No UCL	0.80	0.80	ppbv	4.30	ug/m^3	Max	Too Few Samples for UCL
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.75	No UCL	1.20	1.20	ppbv	6.74	ug/m^3	Max	Too Few Samples for UCL

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: http://www.airtoxics.com/cclasses/unitcalc.html.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3D - Parcel South - Bishop
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations (2)					
						Value	Units	Converted Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	0.75	No UCL	1.3	1.3	ppbv	9.96	ug/m^3	Max	Too Few Samples for UCL
	1,1-DICHLOROETHENE	ppbv	1.95	No UCL	3.6	3.6	ppbv	14.27	ug/m^3	Max	Too Few Samples for UCL
	1,4-DICHLOROBENZENE	ppbv	0.04	No UCL	0.053	0.053	ppbv	0.32	ug/m^3	Max	Too Few Samples for UCL
	ACETONE	ppbv	14.12	No UCL	17.35	17.35	ppbv	41.21	ug/m^3	Max	Too Few Samples for UCL
	BENZENE	ppbv	0.38	No UCL	0.39	0.39	ppbv	1.25	ug/m^3	Max	Too Few Samples for UCL
	CARBON TETRACHLORIDE	ppbv	0.09	No UCL	0.091	0.091	ppbv	0.57	ug/m^3	Max	Too Few Samples for UCL
	CHLOROFORM	ppbv	0.03	No UCL	0.036	0.036	ppbv	0.18	ug/m^3	Max	Too Few Samples for UCL
	DICHLORODIFLUOROMETHANE	ppbv	0.58	No UCL	0.605	0.605	ppbv	2.99	ug/m^3	Max	Too Few Samples for UCL
	ETHYLBENZENE	ppbv	0.28	No UCL	0.4	0.4	ppbv	1.74	ug/m^3	Max	Too Few Samples for UCL
	METHYLENE CHLORIDE	ppbv	0.31	No UCL	0.49	0.49	ppbv	1.7	ug/m^3	Max	Too Few Samples for UCL
	TETRACHLOROETHENE	ppbv	2.27	No UCL	4.3	4.3	ppbv	29.17	ug/m^3	Max	Too Few Samples for UCL
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.49	No UCL	0.65	0.65	ppbv	3.65	ug/m^3	Max	Too Few Samples for UCL

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: http://www.airtoxics.com/cclasses/unitcalc.html.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.3E - Parcel South - LA Carts/Oncology Care
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations (2)					
						Value	Units	Converted Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	0.69	1.45	1.9	1.45	ppbv	11.11	ug/m^3	95% UCL-N	
	1,1-DICHLOROETHENE	ppbv	0.33	0.73	0.92	0.73	ppbv	2.89	ug/m^3	95% UCL-N	
	1,2-DICHLOROETHANE	ppbv	0.048	0.077	0.08	0.077	ppbv	0.31	ug/m^3	95% UCL-N	
	1,4-DICHLOROBENZENE	ppbv	0.048	0.070	0.065	0.065	ppbv	0.39	ug/m^3	Max	UCL is greater than Max
	ACETONE	ppbv	160.6	677	490	490	ppbv	1164	ug/m^3	Max	UCL is greater than Max
	BENZENE	ppbv	0.472	0.60	0.68	0.60	ppbv	1.92	ug/m^3	95% UCL-N	
	CARBON TETRACHLORIDE	ppbv	0.081	0.082	0.083	0.082	ppbv	0.52	ug/m^3	95% UCL-N	
	CHLOROFORM	ppbv	0.089	0.13	0.14	0.13	ppbv	0.63	ug/m^3	95% UCL-N	
	DICHLORODIFLUOROMETHANE	ppbv	0.61	0.67	0.68	0.67	ppbv	3.31	ug/m^3	95% UCL-N	
	ETHYLBENZENE	ppbv	0.28	0.42	0.47	0.42	ppbv	1.82	ug/m^3	95% UCL-G assumed	
	METHYLENE CHLORIDE	ppbv	0.93	1.55	1.7	1.55	ppbv	5.38	ug/m^3	95% UCL-N	
	TETRACHLOROETHENE	ppbv	0.091	0.25	0.24	0.24	ppbv	1.63	ug/m^3	Max	UCL is greater than Max
	TOLUENE	ppbv	43.28	286	150	150	ppbv	565	ug/m^3	Max	UCL is greater than Max
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	0.40	0.53	0.57	0.53	ppbv	2.98	ug/m^3	95% UCL-N	

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Values converted using an online units calculator: http://www.airtoxics.com/cclasses/unitcalc.html.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

TABLE A3-3.4 - Parcel South - Skateland
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil Gas
Exposure Medium:	Indoor Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Distribution (1)	Maximum Detected Concentration	Exposure Point Concentrations					
						Soil Gas Value	Units	Indoor Air Value (2)	Units	Statistic (3)	Rationale
Indoor Air											
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ppbv	80,204	1,014,061	330,000	330,000	ppbv	6.4E+02	ug/m^3	Max	UCL is greater than Max
	1,1-DICHLOROETHENE	ppbv	46,487	562,808	210,000	210,000	ppbv	2.4E+02	ug/m^3	Max	UCL is greater than Max
	1,2,4-TRIMETHYLBENZENE	ppbv	194	2,284	3	3	ppbv	3.1E-03	ug/m^3	Max	UCL is greater than Max
	2,2,4-TRIMETHYLPENTANE	ppbv	72	726	12	12	ppbv	NA	ug/m^3	Max	UCL is greater than Max
	2-BUTANONE	ppbv	68	1,069	2.6	3	ppbv	2.1E-03	ug/m^3	Max	UCL is greater than Max
	4-ETHYLTOLUENE	ppbv	68	1,073	2.4	2	ppbv	NA	ug/m^3	Max	UCL is greater than Max
	ACETONE	ppbv	306	1,286	78	78	ppbv	6.8E-02	ug/m^3	Max	UCL is greater than Max
	CARBON DISULFIDE	ppbv	69	1,050	3.6	4	ppbv	3.5E-03	ug/m^3	Max	UCL is greater than Max
	CHLOROFORM	ppbv	194	2,303	2.5	3	ppbv	3.9E-03	ug/m^3	Max	UCL is greater than Max
	DICHLORODIFLUOROMETHANE	ppbv	415	5,338	1,900	1,900	ppbv	2.1E+00	ug/m^3	Max	UCL is greater than Max
	HEXANE (N-HEXANE)	ppbv	69	1,027	3	3	ppbv	5.1E-03	ug/m^3	Max	UCL is greater than Max
	TETRACHLOROETHENE	ppbv	3,250	11,592	13,000	11,592	ppbv	1.9E+01	ug/m^3	95% UCL-G	
	TRICHLOROETHENE	ppbv	2,538	18,355	7,800	7,800	ppbv	1.1E+01	ug/m^3	Max	UCL is greater than Max
	TRICHLOROFLUOROMETHANE (FREON 11)	ppbv	22,773	252,608	94,000	94,000	ppbv	1.5E+02	ug/m^3	Max	UCL is greater than Max

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Non-parametric (UCL-NP); 95% UCL assuming Gamma distribution (95% G-UCL).

(1) The arithmetic mean and the 95UCL were calculated including half the detection limit for the non-detects. As a result, in some cases these values are above the maximum detected.

(2) Soil gas values modeled to provide indoor air concentrations using EPA Advance Soil Gas Model using Johnson and Ettinger algorithms.

(3) The Shapiro-Wilk test was used to test the normality/ lognormality of all data sets at the 0.05 significance level. The UCL procedures listed were selected based on the recommendations of the ProUCL statistical program and based on the results of the W Test, the number of samples, and the standard deviation of the log-transformed data.

ug/m^3: microgram per cubic meter.

ppbv: parts per billion by volume

NA: Not available. Indoor air concentration could not be calculated because physical parameters for constituent were not available.

Table A3-4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker CTE	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	Chronic Daily Intake (CDI) (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA 2002a (1)	
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	1.7E-07		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	4.9E-07		Intake*CS=CDI	
	Industrial Worker RME	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	Chronic Daily Intake (CDI) (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA 2002a (1)	
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	3.5E-07		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	9.8E-07		Intake*CS=CDI	
	Construction Worker CTE	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA 2002a	
				EF	Exposure Frequency	60	days/year	professional judgment (5)	
				ED	Exposure Duration	1	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	3.4E-09		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	2.3E-07		Intake*CS=CDI	
	Construction Worker RME	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x IR-S x EF x ED x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	480	mg/day	EPA 2002a	
				EF	Exposure Frequency	60	days/year	professional judgment (5)	
				ED	Exposure Duration	1	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	1.6E-08		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	1.1E-06		Intake*CS=CDI	

Table A3-4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal	Industrial Worker	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table B-3.1	mg/kg	See Table B-3.1	CDI (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x SA x AF x ABS x EF x ED x
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA 2002a (6)	1/BW x 1/AT
				AF	Adherence Factor	0.2	mg/cm^2	EPA 2002a	
				ABS	Absorption Factor	Chemical Specific, See Tables 5.1 and 6.1	unitless	EPA 2004a	
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	2.31E-06		Intake*CS*ABS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	6.46E-06		Intake*CS*ABS=CDI	
	Construction Worker	Adult	Surface and Subsurface Soil	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	CDI (mg/kg-day) =
				CF1	Conversion Factor 1	1E-06	kg/mg	--	CS x CF1 x SA x AF x ABS x EF x ED x
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA 2002a (6)	1/BW x 1/AT
				AF	Adherence Factor	0.37	mg/cm^2	EPA 2004a	
				ABS	Absorption Factor	Chemical Specific, See Tables 5.1 and 6.1	unitless	EPA 2004a	
				EF	Exposure Frequency	60	days/year	professional judgment (5)	
				ED	Exposure Duration	1	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	4.10E-08		Intake*CS*ABS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	2.87E-06		Intake*CS*ABS=CDI	
Inhalation	Construction Worker CTE	Adult	Surface and Subsurface Soil as Fugitive Dust	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-A	Inhalation Rate of Air	2.5	m^3/hr	EPA 1991b, 2002	CS x IR-A x ET x EF x ED x 1/PEF x
				ET	Exposure Time	10	hrs/day	professional judgment (5)	
				EF	Exposure Frequency	60	days/year	professional judgment (5)	1/BW x 1/AT
				ED	Exposure Duration	1	years	EPA 1991b, 2002	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA 2002	
				BW	Body Weight	70	kg	EPA 1991b, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	6.2E-13		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	4.3E-11		Intake*CS=CDI	

Table A3-4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Soil (& Particulates and Vapors from Soil)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Worker RME	Adult	Surface and Subsurface Soil as Fugitive Dust	CS	Chemical Concentration in Soil	See Table B-3.2	mg/kg	See Table B-3.2	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-A	Inhalation Rate of Air	4.8	m^3/hr	EPA 1991b, 2002	CS x IR-A x ET x EF x ED x 1/PEF x
				ET	Exposure Time	10	hrs/day	professional judgment (5)	
				EF	Exposure Frequency	60	days/year	professional judgment (5)	1/BW x 1/AT
				ED	Exposure Duration	1	years	EPA 1991b, 2002	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA 2002	
				BW	Body Weight	70	kg	EPA 1991b, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	365	days	EPA 2004a	
					Intake factor, cancer [kg-soil/(kg-bw*d)]	1.2E-12		Intake*CS=CDI	
					Intake factor, noncancer [kg-soil/(kg-bw*d)]	8.3E-11		Intake*CS=CDI	
	Industrial Worker CTE	Adult	Soil Gas Migration to Indoor Air	$C_{building}$	Chemical Concentration in Indoor Air	See Tables B-3.3 and B-3.4	mg/m^3	See Tables B-3.3 and B-3.4	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-A	Inhalation Rate of Air	0.83	m^3/hr	EPA 2002a	$C_{building}$ x IR-A x ET x EF x ED x 1/BW x 1/AT
				ET	Exposure Time	8	hrs/day	professional judgment (5)	
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake factor, cancer [m^3/(kg-bw*d)]	2.3E-02		Intake*CS=CDI	
					Intake factor, noncancer [m^3/(kg-bw*d)]	6.5E-02		Intake*CS=CDI	
	Industrial Worker RME	Adult	Soil Gas Migration to Indoor Air	$C_{building}$	Chemical Concentration in Indoor Air	See Tables B-3.3 and B-3.4	mg/m^3	See Tables B-3.3 and B-3.4	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-A	Inhalation Rate of Air	1.2	m^3/hr	EPA 2002a	$C_{building}$ x IR-A x ET x EF x ED x 1/BW x 1/AT
				ET	Exposure Time	8	hrs/day	professional judgment (5)	
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake factor, cancer [m^3/(kg-bw*d)]	3.4E-02		Intake*CS=CDI	
					Intake factor, noncancer [m^3/(kg-bw*d)]	9.4E-02		Intake*CS=CDI	

(1) Outdoor worker exposure parameter was conservatively applied to this receptor.
(2) Residential exposure parameter was conservatively applied to this receptor.
(3) Assumes 3 days/week in the spring and fall and 5 days/week in the summer, with 13 weeks per season.
(4) Based on number of years in the age group for adolescents (ages 12 to 18 years).
(5) Assumes mowing lawn 1 day/week, May through October.
(6) Based on 50th percentile values for men and women (EPA 1997a) for the following body parts: head, hands, and forearms.
(7) Based on 50th percentile total body surface area for 12 to 18 year olds (EPA 1997a, p6-15) and mean percentage for the following body parts: head, hands, forearms, and lower legs (EPA 1997a, p. 6-16).
(8) AF was selected based on adolescent in dry soil for 95% percentile value.
* Utility worker assumptions were conservatively selected as equal to construction worker exposure assumptions unless noted as being based upon "professional judgment."

Sources:
EPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA 1991b: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA 1997a: Exposure Factors Handbook. Vol. 1: General Factors. ORD. EPA/600/P-95/002Fa.
EPA 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
EPA 2004a: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R/99/005.

cm^2: square centimeter.
kg/mg: kilogram per milligram.
kg: kilogram.
L/day: liter per day.
L/m^3 : liters per cubic meters.
m^3/kg: cubic meter per kilogram.
mg/day: milligram per day.
mg/kg: milligram per kilogram.
mg/ug: milligram per microgram.
ug/L : microgram per liter.
RME: reasonable maximum exposure
CTE: central tendency exposure

Table A3-4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	RME Value	Units	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Industrial Worker CTE	Adult	Groundwater Migration to Indoor Air	$C_{building}$	Chemical Concentration in Indoor Air	See Table B-3.5	mg/m^3	See Table B-3.5	
				IR-A	Inhalation Rate of Groundwater Vapor	0.83	m^3/hr	EPA 2002a	
				ET	Exposure Time	8	hr		
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake Factor- Cancer	2.3E-02			
					Intake Factor - Noncancer	6.5E-02			
	Industrial Worker RME	Adult	Groundwater Migration to Indoor Air	$C_{building}$	Chemical Concentration in Indoor Air	See Table B-3.5	mg/m^3	See Table B-3.5	
				IR-A	Inhalation Rate of Groundwater Vapor	1.2	m^3/hr	EPA 2002a	
				ET	Exposure Time	8	hr		
				EF	Exposure Frequency	250	days/year	EPA 1991b, 2002a	
				ED	Exposure Duration	25	years	EPA 1991b, 2002a	
				BW	Body Weight	70	kg	EPA 1991b, 2002a	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA 2004a	
				AT-N	Averaging Time (Noncancer)	9,125	days	EPA 2004a	
					Intake Factor- Cancer	3.4E-02			
					Intake Factor - Noncancer	9.4E-02			

RME = Reasonable Maximum Exposure.

Sources:

EPA 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA 1997a: Exposure Factors Handbook. Vol. 1: General Factors. ORD. EPA/600/P-95/002Fa.

EPA 2004a: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R/99/005.

EPA 2004b: EPA Region 9 user's Guide and Background Technical Document for USEPA Region 9's Preliminary Remediation Goals (PRG) Table. Obtained online at:

http://www.epa.gov/region09/waste/sfund/prg/index.htm

See Appendix C, Tables 4.1, 4.2 and 4.3 for details.

kg: kilogram

hr: hour

mg/m^3 : milligrams per cubic meter

m^3/hour: cubic meter per hour

TABLE A3-5.1
NON-CANCER TOXICITY DATA - ORAL/DERMAL
Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.8E-01	mg/kg/day	10%	2.8E+00	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	CNS	10	IRIS	11/30/2006
1,1-DICHLOROETHENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day	Liver toxicity	100	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	5.0E-02	mg/kg/day	10%	5.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	3.0E-02	mg/kg/day	10%	3.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DIOXANE	chronic	NA	mg/kg/day	3%	NA	mg/kg/day				11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	6.0E-01	mg/kg/day	10%	6.0E+00	mg/kg/day	Dec. offspring weight	1,000	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Pulmonary alveolar proteinosis	1,000	IRIS	11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/kg/day	10%	NA	mg/kg/day				11/30/2006
ACETONE	chronic	9.0E-01	mg/kg/day	10%	9.0E+00	mg/kg/day	Kidney	1,000	IRIS	11/30/2006
BENZENE	chronic	4.0E-03	mg/kg/day	10%	4.0E-02	mg/kg/day	Dec. lymphocyte count	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	2.0E-02	mg/kg/day	10%	2.0E-01	mg/kg/day	Inc. liver weight	1,000	IRIS	11/30/2006
CARBON DISULFIDE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Fetal toxicity	100	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	7.0E-04	mg/kg/day	10%	7.0E-03	mg/kg/day	Liver lesions	1,000	IRIS	11/30/2006
CHLOROFORM	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver	100	IRIS	11/30/2006
CHROMIUM	chronic	1.5E+00	mg/kg/day	1%	1.5E+02	mg/kg/day	None	100	IRIS	11/30/2006
CHROMIUM VI	chronic	3.0E-03	mg/kg/day		NA	mg/kg/day	None	300	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/kg/day	10%	2.0E+00	mg/kg/day	Dec. body weight	100	IRIS	11/30/2006
DIELDRIN	chronic	5.0E-05	mg/kg/day	5%	1.0E-03	mg/kg/day	Liver	100	IRIS	11/30/2006
ETHYLBENZENE	chronic	1.0E-01	mg/kg/day	10%	1.0E+00	mg/kg/day	Liver and kidney toxicity	1,000	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	1.1E+01	mg/kg/day	10%	1.1E+02	mg/kg/day			EPA-Region 9	10/01/2004
IRON	chronic	3.0E-01	mg/kg/day	1%	3.0E+01	mg/kg/day			EPA-Region 9	10/01/2004
LEAD	chronic	NA	mg/kg/day	1%	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	6.0E-02	mg/kg/day	10%	6.0E-01	mg/kg/day			IRIS	11/30/2006
NAPHTHALENE	chronic	2.0E-02	mg/kg/day	15%	1.3E-01	mg/kg/day	Dec. body weight in males	3,000	IRIS	11/30/2006
PCB-1254 (AROCLOR 1254)	chronic	2.0E-05	mg/kg/day	15%	1.3E-04	mg/kg/day	Ocular exudate	300	IRIS	11/30/2006
PHENANTHRENE	chronic	NA	mg/kg/day	15%	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	1.0E-02	mg/kg/day	10%	1.0E-01	mg/kg/day	Liver toxicity in mice	1,000	IRIS	11/30/2006
TETRAHYDROFURAN	chronic	2.1E-01	mg/kg/day	10%	2.1E+00	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	8.0E-02	mg/kg/day	10%	8.0E-01	mg/kg/day	Inc. kidney weight	3,000	IRIS	11/30/2006
TRICHLOROETHENE	chronic	3.0E-04	mg/kg/day	10%	3.0E-03	mg/kg/day			EPA-Region 9	10/01/2004
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	3.0E-01	mg/kg/day	10%	3.0E+00	mg/kg/day	Survival and histopathology	1,000	IRIS	11/30/2006

Footnotes:
(1) Oral Absorption Efficiency for Dermal contact was based on DTSC PEA Guidance Appendix A Table 2 values for absorption fractions (DTSC 1999).
EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).
HEAST: Healht Effects Assessments Summary Tables (EPA 1997b).
IRIS: Integrated Risk Information System (EPA 2005a).
na: Chemical is listed, no value is available.
ni: No information available.
nl: Chemical is not listed.
CNS: Central Nervous System.
mg/kg/day: milligram per kilogram per day.

TABLE A3-5.2

NON-CANCER TOXICITY DATA - INHALATION

Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Inhalation RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	chronic	2.2E+00	mg/m^3	6.3E-01	mg/kg/day			EPA-Region 9	10/01/2004
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
1,1-DICHLOROETHENE	chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg/day	Liver toxicity	30	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	chronic	6.0E-03	mg/m^3	1.7E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,2-DICHLOROETHANE	chronic	4.9E-03	mg/m^3	1.4E-03	mg/kg/day			EPA-Region 9	10/01/2004
1,4-DICHLOROBENZENE	chronic	8.0E-01	mg/m^3	2.3E-01	mg/kg/day	CNS, RESP, liver, kidney	100	OEHHA	11/30/2006
1,4-DIOXANE	chronic	3.0E+00	mg/m^3	8.6E-01	mg/kg/day	ALIM, Kidney, CVS		OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
2-BUTANONE	chronic	5.0E+00	mg/m^3	1.4E+00	mg/kg/day	DEV	300	IRIS	11/30/2006
2-METHYLNAPHTHALENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
4-ETHYLTOLUENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
ACETONE	chronic	3.2E+00	mg/m^3	9.0E-01	mg/kg/day			EPA-Region 9	10/01/2004
BENZENE	chronic	3.0E-02	mg/m^3	8.6E-03	mg/kg/day	Hematopoetic system, DEV, CNS,	300	IRIS	11/30/2006
BENZO(A)ANTHRACENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
BENZO(A)PYRENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
BENZO(B)FLUORANTHENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	chronic	7.0E-02	mg/m^3	2.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
CARBON DISULFIDE	chronic	7.0E-01	mg/m^3	2.0E-01	mg/kg/day	Peripheral nervous system	30	IRIS	11/30/2006
CARBON TETRACHLORIDE	chronic	4.0E-02	mg/m^3	1.1E-02	mg/kg/day	ALIM, DEV, CNS		OEHHA	11/30/2006
CHLOROFORM	chronic	3.0E-01	mg/m^3	8.6E-02	mg/kg/day	ALIM, Kidney, DEV		OEHHA	11/30/2006
CHROMIUM	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
CHROMIUM VI	chronic	8.0E-06	mg/m^3	2.3E-06	mg/kg/day	RESP	90	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg/day			EPA-Region 9	10/01/2004
DIELDRIN	chronic	1.8E-04	mg/m^3	5.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
ETHYLBENZENE	chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg/day	DEV, ALIM, liver, kidney, endocrine	300	IRIS	11/30/2006
HEXANE (N-HEXANE)	chronic	7.0E-01	mg/m^3	2.0E-01	mg/kg/day	Peripheral necropathy	300	IRIS	11/30/2006
IRON	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
LEAD	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
METHYLENE CHLORIDE	chronic	4.0E-01	mg/m^3	1.1E-01	mg/kg/day	CVS, CNS		OEHHA	11/30/2006
NAPHTHALENE	chronic	3.0E-03	mg/m^3	8.5E-04	mg/kg/day	RESP	3000	IRIS	11/30/2006
PCB-1254 (AROCLOR 1254)	chronic	7.0E-05	mg/m^3	2.0E-05	mg/kg/day			EPA-Region 9	10/01/2004
PHENANTHRENE	chronic	NA	mg/m^3	NA	mg/kg/day				11/30/2006
TETRACHLOROETHENE	chronic	3.5E-02	mg/m^3	1.0E-02	mg/kg/day			EPA-Region 9	10/01/2004
TETRAHYDROFURAN	chronic	3.0E-01	mg/m^3	8.6E-02	mg/kg/day			EPA-Region 9	10/01/2004
TOLUENE	chronic	3.0E-01	mg/m^3	8.6E-02	mg/kg/day	CNS, RESP, DEV	10	OEHHA	11/30/2006
TRICHLOROETHENE	chronic	6.0E-01	mg/m^3	1.7E-01	mg/kg/day	CNS, eyes		OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	chronic	7.0E-01	mg/m^3	2.0E-01	mg/kg/day			EPA-Region 9	10/01/2004

Footnotes:

Cal-EPA: Technical Support Document for Describing Available Cancer Potency Factors (OEHHA 2003).

EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).

EPA-Region 9: USEPA Region IX PRG Table (EPA 2004c).

IRIS: Integrated Risk Information System (EPA 2005a).

na: Chemical is listed, no value is available.

ni: No information available.

mg/m^3: milligram per cubic meter.

mg/kg/day: milligram per kilogram per day.

CNS: Central Nervous system

CVS: Cadiovascular system

RESP: Respiratory system

ALIM: Alimentary system

DEV: Developmental

TABLE A3-6.1

CANCER TOXICITY DATA - ORAL/DERMAL

Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units	(1)	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}	D	OEHHA	11/30/2006
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
1,1-DICHLOROETHENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}	C	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
1,2-DICHLOROETHANE	9.1E-02	mg/kg/day^{-1}	10%	9.1E-03	mg/kg/day^{-1}	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	5.4E-03	mg/kg/day^{-1}	10%	5.4E-04	mg/kg/day^{-1}	2B	OEHHA	11/30/2006
1,4-DIOXANE	2.7E-02	mg/kg/day^{-1}	3%	8.1E-04	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
2-BUTANONE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
2-METHYLNAPHTHALENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
4-ETHYLTOLUENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
ACETONE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
BENZENE	1.0E-01	mg/kg/day^{-1}	10%	1.0E-02	mg/kg/day^{-1}	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.2E+00	mg/kg/day^{-1}	15%	1.8E-01	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.2E+01	mg/kg/day^{-1}	15%	1.8E+00	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.2E+00	mg/kg/day^{-1}	15%	1.8E-01	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E-02	mg/kg/day^{-1}	10%	1.4E-03	mg/kg/day^{-1}	B2	IRIS	11/30/2006
CARBON DISULFIDE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
CARBON TETRACHLORIDE	1.5E-01	mg/kg/day^{-1}	10%	1.5E-02	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
CHLOROFORM	3.1E-02	mg/kg/day^{-1}	10%	3.1E-03	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
CHROMIUM	NA	mg/kg/day^{-1}	1%	NA	mg/kg/day^{-1}	D	IRIS	11/30/2006
CHROMIUM VI	NA	mg/kg/day^{-1}		NA	mg/kg/day^{-1}	A	IRIS	11/30/2006
DICHLORODIFLUOROMETHANE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
DIELDRIN	1.6E+01	mg/kg/day^{-1}	5%	8.0E-01	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
ETHYLBENZENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}	D	IRIS	11/30/2006
HEXANE (N-HEXANE)	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
IRON	NA	mg/kg/day^{-1}	1%	NA	mg/kg/day^{-1}			11/30/2006
LEAD	8.5E-03	mg/kg/day^{-1}	1%	8.5E-05	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.4E-02	mg/kg/day^{-1}	10%	1.4E-03	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
NAPHTHALENE	1.2E-01	mg/kg/day^{-1}	15%	1.8E-02	mg/kg/day^{-1}	C	EPA-Region 9	10/01/2004
PCB-1254 (AROCLOR 1254)	5.0E+00	mg/kg/day^{-1}	15%	7.5E-01	mg/kg/day^{-1}	B2	OEHHA	11/30/2006
PHENANTHRENE	NA	mg/kg/day^{-1}	15%	NA	mg/kg/day^{-1}	D	IRIS	11/30/2006
TETRACHLOROETHENE	5.4E-01	mg/kg/day^{-1}	10%	5.4E-02	mg/kg/day^{-1}	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	7.6E-03	mg/kg/day^{-1}	10%	7.6E-04	mg/kg/day^{-1}		EPA-Region 9	10/01/2004
TOLUENE	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006
TRICHLOROETHENE	1.3E-02	mg/kg/day^{-1}	10%	1.3E-03	mg/kg/day^{-1}	2A	OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	NA	mg/kg/day^{-1}	10%	NA	mg/kg/day^{-1}			11/30/2006

Footnotes:

(1) Oral Absorption Efficiency for Dermal contact was based on DTSC PEA Guidance Appendix A Table 2 values for absorption fractions (DTSC 1999).

EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).

IRIS: Integrated Risk Information System (EPA 2005a).

na: Chemical is listed, no value is available.

ne: Chemical has not been evaluated by EPA for evidence of human carcinogenicity.

ni: No information available.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-6.2

CANCER TOXICITY DATA - INHALATION

Omega Chemical Site - Whittier, California

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-TRICHLOROETHANE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$	D	IRIS	11/30/2006
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
1,1-DICHLOROETHENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$	C	IRIS	11/30/2006
1,2,4-TRIMETHYLBENZENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
1,2-DICHLOROETHANE	2.6E-05	$(ug/m^3)^{-1}$	9.1E-02	$mg/kg/day^{-1}$	B2	IRIS	11/30/2006
1,4-DICHLOROBENZENE	1.1E-05	$(ug/m^3)^{-1}$	4.0E-02	$mg/kg/day^{-1}$	2B	OEHHA	11/30/2006
1,4-DIOXANE	7.7E-06	$(ug/m^3)^{-1}$	2.7E-02	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
2,2,4-TRIMETHYLPENTANE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
2-BUTANONE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
2-METHYLNAPHTHALENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
4-ETHYLTOLUENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
ACETONE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
BENZENE	2.9E-05	$(ug/m^3)^{-1}$	1.0E-01	$mg/kg/day^{-1}$	A	OEHHA	11/30/2006
BENZO(A)ANTHRACENE	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
BENZO(A)PYRENE	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
BENZO(B)FLUORANTHENE	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
BIS(2-ETHYLHEXYL)PHTHALATE	2.4E-06	$(ug/m^3)^{-1}$	8.4E-03	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
CARBON DISULFIDE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
CARBON TETRACHLORIDE	4.3E-05	$(ug/m^3)^{-1}$	1.5E-01	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
CHLOROFORM	2.3E-05	$(ug/m^3)^{-1}$	8.1E-02	$mg/kg/day^{-1}$	B2	IRIS	11/30/2006
CHROMIUM	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$	D	IRIS	11/30/2006
CHROMIUM VI	1.5E-01	$(ug/m^3)^{-1}$	5.1E+02	$mg/kg/day^{-1}$	A	OEHHA	11/30/2006
DICHLORODIFLUOROMETHANE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
DIELDRIN	4.6E-03	$(ug/m^3)^{-1}$	1.6E+01	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
ETHYLBENZENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$	D	IRIS	11/30/2006
HEXANE (N-HEXANE)	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
IRON	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
LEAD	1.2E-05	$(ug/m^3)^{-1}$	4.2E-02	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
METHYLENE CHLORIDE	1.0E-06	$(ug/m^3)^{-1}$	3.5E-03	$mg/kg/day^{-1}$	B2	OEHHA	11/30/2006
NAPHTHALENE	3.4E-05	$(ug/m^3)^{-1}$	1.2E-01	$mg/kg/day^{-1}$	C	OEHHA	11/30/2006
PCB-1254 (AROCLOR 1254)	5.7E-04	$(ug/m^3)^{-1}$	2.0E+00	$mg/kg/day^{-1}$	B2	IRIS	11/30/2006
PHENANTHRENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$	D	IRIS	11/30/2006
TETRACHLOROETHENE	5.9E-06	$(ug/m^3)^{-1}$	2.1E-02	$mg/kg/day^{-1}$	2B	OEHHA	11/30/2006
TETRAHYDROFURAN	1.9E-06	$(ug/m^3)^{-1}$	6.8E-03	$mg/kg/day^{-1}$		EPA-Region 9	10/01/2004
TOLUENE	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006
TRICHLOROETHENE	2.0E-06	$(ug/m^3)^{-1}$	7.0E-03	$mg/kg/day^{-1}$	2A	OEHHA	11/30/2006
TRICHLOROFLUOROMETHANE (FREON 11)	NA	$(ug/m^3)^{-1}$	NA	$mg/kg/day^{-1}$			11/30/2006

Footnotes:

Cal-EPA: Technical Support Document for Describing Available Cancer Potency Factors (OEHHA 2003).

EPA-NCEA: USEPA Region III Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) (EPA 2005b).

IRIS: Integrated Risk Information System (EPA 2005a).

na: Chemical is listed, no value is available.

ne: Chemical has not been evaluated by EPA for evidence of human carcinogenicity.

ni: No information available.

$(ug/m^3)^{-1}$: cubic meter per microgram

$mg/kg/day^{-1}$: milligram per kilogram-day.

TABLE A3-7.1A - Parcel Site, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at Site	Ingestion	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	8.4E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.3E-07	mg/kg/day	4.0E-03	mg/kg/day	5.9E-05
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	3.4E-06	mg/kg/day	1.4E-02	mg/kg/day^{-1}	4.8E-08	9.5E-06	mg/kg/day	2.0E-02	mg/kg/day	4.8E-04
				CHROMIUM	9.9E+01	mg/kg	1.7E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	4.8E-05	mg/kg/day	1.5E+00	mg/kg/day	3.2E-05
				CHROMIUM VI	1.6E+01	mg/kg	2.9E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	8.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.7E-03
				DIELDRIN	1.6E-02	mg/kg	2.8E-09	mg/kg/day	1.6E+01	mg/kg/day^{-1}	4.5E-08	7.9E-09	mg/kg/day	5.0E-05	mg/kg/day	1.6E-04
				IRON	2.3E+04	mg/kg	4.1E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-02	mg/kg/day	3.0E-01	mg/kg/day	3.8E-02
				LEAD	4.4E+01	mg/kg	7.8E-06	mg/kg/day	8.5E-03	mg/kg/day^{-1}	6.6E-08	2.2E-05	mg/kg/day	NA	mg/kg/day	NA
				NAPHTHALENE	1.2E+00	mg/kg	2.1E-07	mg/kg/day	1.2E-01	mg/kg/day^{-1}	2.5E-08	5.9E-07	mg/kg/day	2.0E-02	mg/kg/day	2.9E-05
				PCB-1254 (AROCLOR 1254)	2.5E-01	mg/kg	4.4E-08	mg/kg/day	5.0E+00	mg/kg/day^{-1}	2.2E-07	1.2E-07	mg/kg/day	2.0E-05	mg/kg/day	6.2E-03
				PHENANTHRENE	3.0E-02	mg/kg	5.2E-09	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-08	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								4.0E-07					4.7E-02
			Dermal	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.1E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	3.1E-06	mg/kg/day	4.0E-02	mg/kg/day	7.7E-05
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	4.5E-05	mg/kg/day	1.4E-03	mg/kg/day^{-1}	6.3E-08	1.3E-04	mg/kg/day	2.0E-01	mg/kg/day	6.3E-04
				CHROMIUM	9.9E+01	mg/kg	2.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.4E-04	mg/kg/day	1.5E+02	mg/kg/day	4.3E-06
				CHROMIUM VI	1.6E+01	mg/kg	3.8E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-04	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	1.6E-02	mg/kg	3.7E-08	mg/kg/day	8.0E-01	mg/kg/day^{-1}	3.0E-08	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	5.4E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-01	mg/kg/day	3.0E+01	mg/kg/day	5.0E-03
				LEAD	4.4E+01	mg/kg	1.0E-04	mg/kg/day	8.5E-05	mg/kg/day^{-1}	8.7E-09	2.9E-04	mg/kg/day	NA	mg/kg/day	NA
				NAPHTHALENE	1.2E+00	mg/kg	2.8E-06	mg/kg/day	1.8E-02	mg/kg/day^{-1}	5.0E-08	7.7E-06	mg/kg/day	1.3E-01	mg/kg/day	5.8E-05
				PCB-1254 (AROCLOR 1254)	2.5E-01	mg/kg	5.8E-07	mg/kg/day	7.5E-01	mg/kg/day^{-1}	4.4E-07	1.6E-06	mg/kg/day	1.3E-04	mg/kg/day	1.2E-02
				PHENANTHRENE	3.0E-02	mg/kg	6.9E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-07	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								5.9E-07					1.8E-02
		Exposure Point Total									9.9E-07					6.6E-02
Surface Soil Total											9.9E-07					6.6E-02

TABLE A3-7.1A - Parcel Site, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.7E+01	ug/m3	3.9E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	1.6E+01	ug/m3	3.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-03	mg/kg/day	5.7E-02	mg/kg/day	1.8E-02
				ACETONE	5.9E+03	ug/m3	1.4E-01	mg/kg/day	NA	mg/kg/day^{-1}	---	3.9E-01	mg/kg/day	9.0E-01	mg/kg/day	4.3E-01
				BENZENE	9.7E+00	ug/m3	2.3E-04	mg/kg/day	1.0E-01	mg/kg/day^{-1}	2.3E-05	6.3E-04	mg/kg/day	8.6E-03	mg/kg/day	7.4E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	1.6E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.4E-06	4.5E-05	mg/kg/day	1.1E-02	mg/kg/day	3.9E-03
				CHLOROFORM	2.4E-01	ug/m3	5.7E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	4.6E-07	1.6E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04
				DICHLORODIFLUOROMETHANE	3.1E+00	ug/m3	7.1E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.5E-03
				ETHYLBENZENE	2.6E+01	ug/m3	5.9E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.7E-03	mg/kg/day	2.9E-01	mg/kg/day	5.8E-03
				METHYLENE CHLORIDE	2.6E+02	ug/m3	6.0E-03	mg/kg/day	3.5E-03	mg/kg/day^{-1}	2.1E-05	1.7E-02	mg/kg/day	1.1E-01	mg/kg/day	1.5E-01
				TETRACHLOROETHENE	1.8E+01	ug/m3	4.3E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	8.8E-06	1.2E-03	mg/kg/day	1.0E-02	mg/kg/day	1.2E-01
				TOLUENE	2.0E+03	ug/m3	4.6E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	1.3E-01	mg/kg/day	8.6E-02	mg/kg/day	1.5E+00
				TRICHLOROETHENE	5.3E+00	ug/m3	1.2E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	8.6E-07	3.5E-04	mg/kg/day	1.7E-01	mg/kg/day	2.0E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	9.0E+00	ug/m3	2.1E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	5.8E-04	mg/kg/day	2.0E-01	mg/kg/day	2.9E-03
			Exp. Route Total								5.6E-05					2.3E+00
		Exposure Point Total									5.6E-05					2.3E+00
Indoor Air Total											5.6E-05					2.3E+00
										Total of Receptor Risks Across All Media	5.7E-05				Total of Receptor Hazards Across All Media	2.4E+00

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.1B - Parcel North, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.9E+01	ug/m3	9.1E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.5E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	8.7E+00	ug/m3	2.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	5.7E-04	mg/kg/day	5.7E-02	mg/kg/day	9.9E-03
				1,4-DICHLOROBENZENE	7.8E-01	ug/m3	1.8E-05	mg/kg/day	4.0E-02	mg/kg/day^{-1}	7.3E-07	5.1E-05	mg/kg/day	2.3E-01	mg/kg/day	2.2E-04
				ACETONE	3.3E+03	ug/m3	7.7E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-01	mg/kg/day	9.0E-01	mg/kg/day	2.4E-01
				BENZENE	1.1E+00	ug/m3	2.4E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	2.4E-06	6.8E-05	mg/kg/day	8.6E-03	mg/kg/day	8.0E-03
				CARBON TETRACHLORIDE	8.2E-01	ug/m3	1.9E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.8E-06	5.3E-05	mg/kg/day	1.1E-02	mg/kg/day	4.7E-03
				CHLOROFORM	3.4E-01	ug/m3	7.9E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	6.4E-07	2.2E-05	mg/kg/day	8.6E-02	mg/kg/day	2.6E-04
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	7.0E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.4E-03
				ETHYLBENZENE	8.2E-01	ug/m3	1.9E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	5.4E-05	mg/kg/day	2.9E-01	mg/kg/day	1.9E-04
				METHYLENE CHLORIDE	4.9E+00	ug/m3	1.1E-04	mg/kg/day	3.5E-03	mg/kg/day^{-1}	3.9E-07	3.2E-04	mg/kg/day	1.1E-01	mg/kg/day	2.8E-03
				TETRACHLOROETHENE	2.2E+01	ug/m3	5.2E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.1E-05	1.5E-03	mg/kg/day	1.0E-02	mg/kg/day	1.5E-01
				TRICHLOROETHENE	1.3E+01	ug/m3	3.1E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	2.2E-06	8.7E-04	mg/kg/day	1.7E-01	mg/kg/day	5.1E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.1E+01	ug/m3	2.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	7.3E-04	mg/kg/day	2.0E-01	mg/kg/day	3.7E-03
			Exp. Route Total								2.0E-05					4.2E-01
		Exposure Point Total									2.0E-05					4.2E-01
Indoor Air Total											2.0E-05					4.2E-01
										Total of Receptor Risks Across All Media	2.0E-05				Total of Receptor Hazards Across All Media	4.2E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

(1) The total only includes the maximum calculated risks and hazards of the inhalation pathways through soil gas, groundwater, and indoor air since receptors are exposed to these media all through the indoor air pathway.

TABLE A3-7.1C - Parcel West, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.6E+01	ug/m3	6.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.7E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.3E+01	ug/m3	5.2E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-03	mg/kg/day	5.7E-02	mg/kg/day	2.6E-02
				1,4-DICHLOROBENZENE	3.0E-01	ug/m3	7.0E-06	mg/kg/day	4.0E-02	mg/kg/day^{-1}	2.8E-07	2.0E-05	mg/kg/day	2.3E-01	mg/kg/day	8.5E-05
				ACETONE	4.3E+01	ug/m3	9.9E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.8E-03	mg/kg/day	9.0E-01	mg/kg/day	3.1E-03
				BENZENE	1.4E+00	ug/m3	3.3E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	3.3E-06	9.4E-05	mg/kg/day	8.6E-03	mg/kg/day	1.1E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	1.6E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.4E-06	4.5E-05	mg/kg/day	1.1E-02	mg/kg/day	3.9E-03
				CHLOROFORM	2.4E-01	ug/m3	5.7E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	4.6E-07	1.6E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04
				DICHLORODIFLUOROMETHANE	2.9E+00	ug/m3	6.7E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.3E-03
				ETHYLBENZENE	1.6E+00	ug/m3	3.6E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-04	mg/kg/day	2.9E-01	mg/kg/day	3.5E-04
				METHYLENE CHLORIDE	1.5E+00	ug/m3	3.5E-05	mg/kg/day	3.5E-03	mg/kg/day^{-1}	1.2E-07	9.7E-05	mg/kg/day	1.1E-01	mg/kg/day	8.5E-04
				TETRACHLOROETHENE	1.0E+02	ug/m3	2.4E-03	mg/kg/day	2.1E-02	mg/kg/day^{-1}	4.9E-05	6.6E-03	mg/kg/day	1.0E-02	mg/kg/day	6.6E-01
				TRICHLOROETHENE	4.3E+00	ug/m3	1.0E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	7.0E-07	2.8E-04	mg/kg/day	1.7E-01	mg/kg/day	1.6E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	6.7E+00	ug/m3	1.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	4.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.2E-03
			Exp. Route Total								5.6E-05					7.1E-01
		Exposure Point Total									5.6E-05					7.1E-01
Indoor Air Total											5.6E-05					7.1E-01
										Total of Receptor Risks Across All Media	5.6E-05				Total of Receptor Hazards Across All Media	7.1E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.1D - Parcel South - Bishop, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.0E+01	ug/m3	2.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.5E-04	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	1.4E+01	ug/m3	3.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	9.3E-04	mg/kg/day	5.7E-02	mg/kg/day	1.6E-02
				1,4-DICHLOROBENZENE	3.2E-01	ug/m3	7.4E-06	mg/kg/day	4.0E-02	mg/kg/day^{-1}	3.0E-07	2.1E-05	mg/kg/day	2.3E-01	mg/kg/day	9.1E-05
				ACETONE	4.1E+01	ug/m3	9.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.7E-03	mg/kg/day	9.0E-01	mg/kg/day	3.0E-03
				BENZENE	1.3E+00	ug/m3	2.9E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	2.9E-06	8.1E-05	mg/kg/day	8.6E-03	mg/kg/day	9.5E-03
				CARBON TETRACHLORIDE	5.7E-01	ug/m3	1.3E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.0E-06	3.7E-05	mg/kg/day	1.1E-02	mg/kg/day	3.3E-03
				CHLOROFORM	1.8E-01	ug/m3	4.1E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	3.3E-07	1.1E-05	mg/kg/day	8.6E-02	mg/kg/day	1.3E-04
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	6.9E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.4E-03
				ETHYLBENZENE	1.7E+00	ug/m3	4.0E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-04	mg/kg/day	2.9E-01	mg/kg/day	4.0E-04
				METHYLENE CHLORIDE	1.7E+00	ug/m3	3.9E-05	mg/kg/day	3.5E-03	mg/kg/day^{-1}	1.4E-07	1.1E-04	mg/kg/day	1.1E-01	mg/kg/day	9.7E-04
				TETRACHLOROETHENE	2.9E+01	ug/m3	6.8E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.4E-05	1.9E-03	mg/kg/day	1.0E-02	mg/kg/day	1.9E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	3.7E+00	ug/m3	8.5E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.4E-04	mg/kg/day	2.0E-01	mg/kg/day	1.2E-03
			Exp. Route Total								2.0E-05					2.3E-01
		Exposure Point Total									2.0E-05					2.3E-01
Indoor Air Total											2.0E-05					2.3E-01
										Total of Receptor Risks Across All Media	2.0E-05				Total of Receptor Hazards Across All Media	2.3E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.1E - Parcel South - LA Carts/Oncology Care, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1E+01	ug/m3	2.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	7.2E-04	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.9E+00	ug/m3	6.7E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-04	mg/kg/day	5.7E-02	mg/kg/day	3.3E-03
				1,2-DICHLOROETHANE	3.1E-01	ug/m3	7.2E-06	mg/kg/day	9.1E-02	mg/kg/day^{-1}	6.6E-07	2.0E-05	mg/kg/day	1.4E-03	mg/kg/day	1.4E-02
				1,4-DICHLOROBENZENE	3.9E-01	ug/m3	9.1E-06	mg/kg/day	4.0E-02	mg/kg/day^{-1}	3.6E-07	2.5E-05	mg/kg/day	2.3E-01	mg/kg/day	1.1E-04
				ACETONE	1.2E+03	ug/m3	2.7E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	7.6E-02	mg/kg/day	9.0E-01	mg/kg/day	8.4E-02
				BENZENE	1.9E+00	ug/m3	4.5E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	4.5E-06	1.2E-04	mg/kg/day	8.6E-03	mg/kg/day	1.5E-02
				CARBON TETRACHLORIDE	5.2E-01	ug/m3	1.2E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	1.8E-06	3.4E-05	mg/kg/day	1.1E-02	mg/kg/day	2.9E-03
				CHLOROFORM	6.3E-01	ug/m3	1.5E-05	mg/kg/day	8.1E-02	mg/kg/day^{-1}	1.2E-06	4.1E-05	mg/kg/day	8.6E-02	mg/kg/day	4.8E-04
				DICHLORODIFLUOROMETHANE	3.3E+00	ug/m3	7.7E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-04	mg/kg/day	5.7E-02	mg/kg/day	3.8E-03
				ETHYLBENZENE	1.8E+00	ug/m3	4.2E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.2E-04	mg/kg/day	2.9E-01	mg/kg/day	4.1E-04
				METHYLENE CHLORIDE	5.4E+00	ug/m3	1.2E-04	mg/kg/day	3.5E-03	mg/kg/day^{-1}	4.4E-07	3.5E-04	mg/kg/day	1.1E-01	mg/kg/day	3.1E-03
				TETRACHLOROETHENE	1.6E+00	ug/m3	3.8E-05	mg/kg/day	2.1E-02	mg/kg/day^{-1}	7.8E-07	1.1E-04	mg/kg/day	1.0E-02	mg/kg/day	1.1E-02
				TOLUENE	5.7E+02	ug/m3	1.3E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	3.7E-02	mg/kg/day	8.6E-02	mg/kg/day	4.3E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	3.0E+00	ug/m3	6.9E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-04	mg/kg/day	2.0E-01	mg/kg/day	9.7E-04
			Exp. Route Total								9.7E-06					5.7E-01
		Exposure Point Total									9.7E-06					5.7E-01
Indoor Air Total											9.7E-06					5.7E-01
										Total of Receptor Risks Across All Media	9.7E-06				Total of Receptor Hazards Across All Media	5.7E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.1F - Parcel South, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	2.3E-02	Inhalation of soil vapor:	6.5E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	2.3E-02	Inhalation of gw vapor:	6.5E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	6.4E+02	ug/m3	1.5E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	4.2E-02	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.4E+02	ug/m3	5.5E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-02	mg/kg/day	5.7E-02	mg/kg/day	2.7E-01
				1,2,4-TRIMETHYLBENZENE	3.1E-03	ug/m3	7.1E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-07	mg/kg/day	1.7E-03	mg/kg/day	1.2E-04
				2,2,4-TRIMETHYLPENTANE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day^{-1}	---	---	mg/kg/day	NA	mg/kg/day	NA
				2-BUTANONE	2.1E-03	ug/m3	4.8E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-07	mg/kg/day	1.4E+00	mg/kg/day	9.5E-08
				4-ETHYLTOLUENE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day^{-1}	---	---	mg/kg/day	NA	mg/kg/day	NA
				ACETONE	6.8E-02	ug/m3	1.6E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	4.4E-06	mg/kg/day	9.0E-01	mg/kg/day	4.9E-06
				CARBON DISULFIDE	3.5E-03	ug/m3	8.2E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.2E-06
				CHLOROFORM	3.9E-03	ug/m3	9.0E-08	mg/kg/day	8.1E-02	mg/kg/day^{-1}	7.2E-09	2.5E-07	mg/kg/day	8.6E-02	mg/kg/day	2.9E-06
				DICHLORODIFLUOROMETHANE	2.1E+00	ug/m3	4.9E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-04	mg/kg/day	5.7E-02	mg/kg/day	2.4E-03
				HEXANE (N-HEXANE)	5.1E-03	ug/m3	1.2E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.7E-06
				TETRACHLOROETHENE	1.9E+01	ug/m3	4.4E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	9.0E-06	1.2E-03	mg/kg/day	1.0E-02	mg/kg/day	1.2E-01
				TRICHLOROETHENE	1.1E+01	ug/m3	2.5E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	1.8E-06	7.0E-04	mg/kg/day	1.7E-01	mg/kg/day	4.1E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.5E+02	ug/m3	3.4E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	9.5E-03	mg/kg/day	2.0E-01	mg/kg/day	4.8E-02
			Exp. Route Total								1.1E-05					4.5E-01
		Exposure Point Total									1.1E-05					4.5E-01
Soil Gas Total											1.1E-05					4.5E-01
										Total of Receptor Risks Across All Media	1.1E-05				Total of Receptor Hazards Across All Media	4.5E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2A - Parcel Site, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	Surface Soil at Site	Ingestion	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.7E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	4.7E-07	mg/kg/day	4.0E-03	mg/kg/day	1.2E-04
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	6.8E-06	mg/kg/day	1.4E-02	mg/kg/day^{-1}	9.5E-08	1.9E-05	mg/kg/day	2.0E-02	mg/kg/day	9.5E-04
				CHROMIUM	9.9E+01	mg/kg	3.5E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	9.7E-05	mg/kg/day	1.5E+00	mg/kg/day	6.5E-05
				CHROMIUM VI	1.6E+01	mg/kg	5.8E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	1.6E-05	mg/kg/day	3.0E-03	mg/kg/day	5.4E-03
				DIELDRIN	1.6E-02	mg/kg	5.6E-09	mg/kg/day	1.6E+01	mg/kg/day^{-1}	9.0E-08	1.6E-08	mg/kg/day	5.0E-05	mg/kg/day	3.1E-04
				IRON	2.3E+04	mg/kg	8.1E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	2.3E-02	mg/kg/day	3.0E-01	mg/kg/day	7.6E-02
				LEAD	4.4E+01	mg/kg	1.6E-05	mg/kg/day	8.5E-03	mg/kg/day^{-1}	1.3E-07	4.3E-05	mg/kg/day	NA	mg/kg/day	NA
				NAPHTHALENE	1.2E+00	mg/kg	4.2E-07	mg/kg/day	1.2E-01	mg/kg/day^{-1}	5.0E-08	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	5.9E-05
				PCB-1254 (AROCLOR 1254)	2.5E-01	mg/kg	8.8E-08	mg/kg/day	5.0E+00	mg/kg/day^{-1}	4.4E-07	2.5E-07	mg/kg/day	2.0E-05	mg/kg/day	1.2E-02
				PHENANTHRENE	3.0E-02	mg/kg	1.0E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.9E-08	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								8.1E-07					9.5E-02
			Dermal	2-METHYLNAPHTHALENE	4.8E-01	mg/kg	1.1E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	3.1E-06	mg/kg/day	4.0E-02	mg/kg/day	7.7E-05
				BIS(2-ETHYLHEXYL)PHTHALATE	1.9E+01	mg/kg	4.5E-05	mg/kg/day	1.4E-03	mg/kg/day^{-1}	6.3E-08	1.3E-04	mg/kg/day	2.0E-01	mg/kg/day	6.3E-04
				CHROMIUM	9.9E+01	mg/kg	2.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.4E-04	mg/kg/day	1.5E+02	mg/kg/day	4.3E-06
				CHROMIUM VI	1.6E+01	mg/kg	3.8E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-04	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	1.6E-02	mg/kg	3.7E-08	mg/kg/day	8.0E-01	mg/kg/day^{-1}	3.0E-08	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	5.4E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-01	mg/kg/day	3.0E+01	mg/kg/day	5.0E-03
				LEAD	4.4E+01	mg/kg	1.0E-04	mg/kg/day	8.5E-05	mg/kg/day^{-1}	8.7E-09	2.9E-04	mg/kg/day	NA	mg/kg/day	NA
				NAPHTHALENE	1.2E+00	mg/kg	2.8E-06	mg/kg/day	1.8E-02	mg/kg/day^{-1}	5.0E-08	7.7E-06	mg/kg/day	1.3E-01	mg/kg/day	5.8E-05
				PCB-1254 (AROCLOR 1254)	2.5E-01	mg/kg	5.8E-07	mg/kg/day	7.5E-01	mg/kg/day^{-1}	4.4E-07	1.6E-06	mg/kg/day	1.3E-04	mg/kg/day	1.2E-02
				PHENANTHRENE	3.0E-02	mg/kg	6.9E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-07	mg/kg/day	NA	mg/kg/day	NA
			Exp. Route Total								5.9E-07					1.8E-02
		Exposure Point Total									1.4E-06					1.1E-01
Surface Soil Total											1.4E-06					1.1E-01

TABLE A3-7.2A - Parcel Site, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.7E+01	ug/m3	5.7E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.6E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	1.6E+01	ug/m3	5.2E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-03	mg/kg/day	5.7E-02	mg/kg/day	2.6E-02
				ACETONE	5.9E+03	ug/m3	2.0E-01	mg/kg/day	NA	mg/kg/day^{-1}	---	5.6E-01	mg/kg/day	9.0E-01	mg/kg/day	6.2E-01
				BENZENE	9.7E+00	ug/m3	3.3E-04	mg/kg/day	1.0E-01	mg/kg/day^{-1}	3.3E-05	9.1E-04	mg/kg/day	8.6E-03	mg/kg/day	1.1E-01
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	2.3E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	3.5E-06	6.5E-05	mg/kg/day	1.1E-02	mg/kg/day	5.7E-03
				CHLOROFORM	2.4E-01	ug/m3	8.2E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	6.6E-07	2.3E-05	mg/kg/day	8.6E-02	mg/kg/day	2.7E-04
				DICHLORODIFLUOROMETHANE	3.1E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.9E-04	mg/kg/day	5.7E-02	mg/kg/day	5.0E-03
				ETHYLBENZENE	2.6E+01	ug/m3	8.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.4E-03	mg/kg/day	2.9E-01	mg/kg/day	8.4E-03
				METHYLENE CHLORIDE	2.6E+02	ug/m3	8.6E-03	mg/kg/day	3.5E-03	mg/kg/day^{-1}	3.0E-05	2.4E-02	mg/kg/day	1.1E-01	mg/kg/day	2.1E-01
				TETRACHLOROETHENE	1.8E+01	ug/m3	6.2E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.3E-05	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01
				TOLUENE	2.0E+03	ug/m3	6.6E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-01	mg/kg/day	8.6E-02	mg/kg/day	2.2E+00
				TRICHLOROETHENE	5.3E+00	ug/m3	1.8E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	1.2E-06	5.0E-04	mg/kg/day	1.7E-01	mg/kg/day	2.9E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	9.0E+00	ug/m3	3.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	8.4E-04	mg/kg/day	2.0E-01	mg/kg/day	4.2E-03
			Exp. Route Total								8.1E-05					3.3E+00
		Exposure Point Total									8.1E-05					3.3E+00
Indoor Air Total											8.1E-05					3.3E+00
										Total of Receptor Risks Across All Media	8.2E-05				Total of Receptor Hazards Across All Media	3.4E+00

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2B - Parcel North, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	3.9E+01	ug/m3	1.3E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	3.7E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	8.7E+00	ug/m3	2.9E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	8.2E-04	mg/kg/day	5.7E-02	mg/kg/day	1.4E-02
				1,4-DICHLOROBENZENE	7.8E-01	ug/m3	2.6E-05	mg/kg/day	4.0E-02	mg/kg/day^{-1}	1.0E-06	7.3E-05	mg/kg/day	2.3E-01	mg/kg/day	3.2E-04
				ACETONE	3.3E+03	ug/m3	1.1E-01	mg/kg/day	NA	mg/kg/day^{-1}	---	3.1E-01	mg/kg/day	9.0E-01	mg/kg/day	3.5E-01
				BENZENE	1.1E+00	ug/m3	3.5E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	3.5E-06	9.9E-05	mg/kg/day	8.6E-03	mg/kg/day	1.2E-02
				CARBON TETRACHLORIDE	8.2E-01	ug/m3	2.7E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	4.1E-06	7.7E-05	mg/kg/day	1.1E-02	mg/kg/day	6.7E-03
				CHLOROFORM	3.4E-01	ug/m3	1.1E-05	mg/kg/day	8.1E-02	mg/kg/day^{-1}	9.2E-07	3.2E-05	mg/kg/day	8.6E-02	mg/kg/day	3.7E-04
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.8E-04	mg/kg/day	5.7E-02	mg/kg/day	5.0E-03
				ETHYLBENZENE	8.2E-01	ug/m3	2.8E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	7.7E-05	mg/kg/day	2.9E-01	mg/kg/day	2.7E-04
				METHYLENE CHLORIDE	4.9E+00	ug/m3	1.6E-04	mg/kg/day	3.5E-03	mg/kg/day^{-1}	5.7E-07	4.6E-04	mg/kg/day	1.1E-01	mg/kg/day	4.0E-03
				TETRACHLOROETHENE	2.2E+01	ug/m3	7.5E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.6E-05	2.1E-03	mg/kg/day	1.0E-02	mg/kg/day	2.1E-01
				TRICHLOROETHENE	1.3E+01	ug/m3	4.5E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	3.2E-06	1.3E-03	mg/kg/day	1.7E-01	mg/kg/day	7.4E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.1E+01	ug/m3	3.8E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-03	mg/kg/day	2.0E-01	mg/kg/day	5.3E-03
			Exp. Route Total								2.9E-05					6.1E-01
		Exposure Point Total									2.9E-05					6.1E-01
Indoor Air Total											2.9E-05					6.1E-01
										Total of Receptor Risks Across All Media	2.9E-05				Total of Receptor Hazards Across All Media	6.1E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2C - Parcel West, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.6E+01	ug/m3	8.7E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.4E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.3E+01	ug/m3	7.6E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.1E-03	mg/kg/day	5.7E-02	mg/kg/day	3.7E-02
				1,4-DICHLOROBENZENE	3.0E-01	ug/m3	1.0E-05	mg/kg/day	4.0E-02	mg/kg/day^{-1}	4.0E-07	2.8E-05	mg/kg/day	2.3E-01	mg/kg/day	1.2E-04
				ACETONE	4.3E+01	ug/m3	1.4E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	4.0E-03	mg/kg/day	9.0E-01	mg/kg/day	4.5E-03
				BENZENE	1.4E+00	ug/m3	4.8E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	4.8E-06	1.4E-04	mg/kg/day	8.6E-03	mg/kg/day	1.6E-02
				CARBON TETRACHLORIDE	6.9E-01	ug/m3	2.3E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	3.5E-06	6.5E-05	mg/kg/day	1.1E-02	mg/kg/day	5.7E-03
				CHLOROFORM	2.4E-01	ug/m3	8.2E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	6.6E-07	2.3E-05	mg/kg/day	8.6E-02	mg/kg/day	2.7E-04
				DICHLORODIFLUOROMETHANE	2.9E+00	ug/m3	9.6E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.7E-04	mg/kg/day	5.7E-02	mg/kg/day	4.7E-03
				ETHYLBENZENE	1.6E+00	ug/m3	5.2E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-04	mg/kg/day	2.9E-01	mg/kg/day	5.1E-04
				METHYLENE CHLORIDE	1.5E+00	ug/m3	5.0E-05	mg/kg/day	3.5E-03	mg/kg/day^{-1}	1.7E-07	1.4E-04	mg/kg/day	1.1E-01	mg/kg/day	1.2E-03
				TETRACHLOROETHENE	1.0E+02	ug/m3	3.4E-03	mg/kg/day	2.1E-02	mg/kg/day^{-1}	7.0E-05	9.6E-03	mg/kg/day	1.0E-02	mg/kg/day	9.6E-01
				TRICHLOROETHENE	4.3E+00	ug/m3	1.4E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	1.0E-06	4.0E-04	mg/kg/day	1.7E-01	mg/kg/day	2.4E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	6.7E+00	ug/m3	2.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.3E-04	mg/kg/day	2.0E-01	mg/kg/day	3.2E-03
			Exp. Route Total								8.1E-05					1.0E+00
		Exposure Point Total									8.1E-05					1.0E+00
Indoor Air Total											8.1E-05					1.0E+00
										Total of Receptor Risks Across All Media	8.1E-05				Total of Receptor Hazards Across All Media	1.0E+00

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2D - Parcel South - Bishop, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.0E+01	ug/m3	3.3E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	9.4E-04	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	1.4E+01	ug/m3	4.8E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.3E-03	mg/kg/day	5.7E-02	mg/kg/day	2.4E-02
				1,4-DICHLOROBENZENE	3.2E-01	ug/m3	1.1E-05	mg/kg/day	4.0E-02	mg/kg/day^{-1}	4.3E-07	3.0E-05	mg/kg/day	2.3E-01	mg/kg/day	1.3E-04
				ACETONE	4.1E+01	ug/m3	1.4E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	3.9E-03	mg/kg/day	9.0E-01	mg/kg/day	4.3E-03
				BENZENE	1.3E+00	ug/m3	4.2E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	4.2E-06	1.2E-04	mg/kg/day	8.6E-03	mg/kg/day	1.4E-02
				CARBON TETRACHLORIDE	5.7E-01	ug/m3	1.9E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.9E-06	5.4E-05	mg/kg/day	1.1E-02	mg/kg/day	4.7E-03
				CHLOROFORM	1.8E-01	ug/m3	5.9E-06	mg/kg/day	8.1E-02	mg/kg/day^{-1}	4.7E-07	1.7E-05	mg/kg/day	8.6E-02	mg/kg/day	1.9E-04
				DICHLORODIFLUOROMETHANE	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.8E-04	mg/kg/day	5.7E-02	mg/kg/day	4.9E-03
				ETHYLBENZENE	1.7E+00	ug/m3	5.8E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.6E-04	mg/kg/day	2.9E-01	mg/kg/day	5.7E-04
				METHYLENE CHLORIDE	1.7E+00	ug/m3	5.7E-05	mg/kg/day	3.5E-03	mg/kg/day^{-1}	2.0E-07	1.6E-04	mg/kg/day	1.1E-01	mg/kg/day	1.4E-03
				TETRACHLOROETHENE	2.9E+01	ug/m3	9.8E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	2.0E-05	2.7E-03	mg/kg/day	1.0E-02	mg/kg/day	2.7E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	3.7E+00	ug/m3	1.2E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	3.4E-04	mg/kg/day	2.0E-01	mg/kg/day	1.7E-03
			Exp. Route Total								2.8E-05					3.3E-01
		Exposure Point Total									2.8E-05					3.3E-01
Indoor Air Total											2.8E-05					3.3E-01
										Total of Receptor Risks Across All Media	2.8E-05				Total of Receptor Hazards Across All Media	3.3E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2E - Parcel South - LA Carts/Oncology Care, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.1E+01	ug/m3	3.7E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-03	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.9E+00	ug/m3	9.7E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.7E-04	mg/kg/day	5.7E-02	mg/kg/day	4.8E-03
				1,2-DICHLOROETHANE	3.1E-01	ug/m3	1.0E-05	mg/kg/day	9.1E-02	mg/kg/day^{-1}	9.5E-07	2.9E-05	mg/kg/day	1.4E-03	mg/kg/day	2.1E-02
				1,4-DICHLOROBENZENE	3.9E-01	ug/m3	1.3E-05	mg/kg/day	4.0E-02	mg/kg/day^{-1}	5.2E-07	3.7E-05	mg/kg/day	2.3E-01	mg/kg/day	1.6E-04
				ACETONE	1.2E+03	ug/m3	3.9E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-01	mg/kg/day	9.0E-01	mg/kg/day	1.2E-01
				BENZENE	1.9E+00	ug/m3	6.4E-05	mg/kg/day	1.0E-01	mg/kg/day^{-1}	6.4E-06	1.8E-04	mg/kg/day	8.6E-03	mg/kg/day	2.1E-02
				CARBON TETRACHLORIDE	5.2E-01	ug/m3	1.7E-05	mg/kg/day	1.5E-01	mg/kg/day^{-1}	2.6E-06	4.8E-05	mg/kg/day	1.1E-02	mg/kg/day	4.3E-03
				CHLOROFORM	6.3E-01	ug/m3	2.1E-05	mg/kg/day	8.1E-02	mg/kg/day^{-1}	1.7E-06	6.0E-05	mg/kg/day	8.6E-02	mg/kg/day	7.0E-04
				DICHLORODIFLUOROMETHANE	3.3E+00	ug/m3	1.1E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	3.1E-04	mg/kg/day	5.7E-02	mg/kg/day	5.4E-03
				ETHYLBENZENE	1.8E+00	ug/m3	6.1E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	1.7E-04	mg/kg/day	2.9E-01	mg/kg/day	6.0E-04
				METHYLENE CHLORIDE	5.4E+00	ug/m3	1.8E-04	mg/kg/day	3.5E-03	mg/kg/day^{-1}	6.3E-07	5.1E-04	mg/kg/day	1.1E-01	mg/kg/day	4.4E-03
				TETRACHLOROETHENE	1.6E+00	ug/m3	5.5E-05	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.1E-06	1.5E-04	mg/kg/day	1.0E-02	mg/kg/day	1.5E-02
				TOLUENE	5.7E+02	ug/m3	1.9E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	5.3E-02	mg/kg/day	8.6E-02	mg/kg/day	6.2E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	3.0E+00	ug/m3	1.0E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.8E-04	mg/kg/day	2.0E-01	mg/kg/day	1.4E-03
			Exp. Route Total								1.4E-05					8.2E-01
		Exposure Point Total									1.4E-05					8.2E-01
Indoor Air Total											1.4E-05					8.2E-01
										Total of Receptor Risks Across All Media	1.4E-05				Total of Receptor Hazards Across All Media	8.2E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.2F - Parcel South, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake		Noncancer Intake	
Surface Soil		**Surface Soil**	
Ingestion:	3.5E-07	Ingestion:	9.8E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of gw vapor:	3.4E-02	Inhalation of gw vapor:	9.4E-02

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Indoor Air	Indoor Air	Inhalation	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	6.4E+02	ug/m3	2.2E-02	mg/kg/day	NA	mg/kg/day^{-1}	---	6.1E-02	mg/kg/day	NA	mg/kg/day	NA
				1,1-DICHLOROETHENE	2.4E+02	ug/m3	7.9E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-02	mg/kg/day	5.7E-02	mg/kg/day	3.9E-01
				1,2,4-TRIMETHYLBENZENE	3.1E-03	ug/m3	1.0E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	2.9E-07	mg/kg/day	1.7E-03	mg/kg/day	1.7E-04
				2,2,4-TRIMETHYLPENTANE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day^{-1}	---	---	mg/kg/day	NA	mg/kg/day	NA
				2-BUTANONE	2.1E-03	ug/m3	7.0E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-07	mg/kg/day	1.4E+00	mg/kg/day	1.4E-07
				4-ETHYLTOLUENE	NA	ug/m3	---	mg/kg/day	NA	mg/kg/day^{-1}	---	---	mg/kg/day	NA	mg/kg/day	NA
				ACETONE	6.8E-02	ug/m3	2.3E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	6.4E-06	mg/kg/day	9.0E-01	mg/kg/day	7.1E-06
				CARBON DISULFIDE	3.5E-03	ug/m3	1.2E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.3E-07	mg/kg/day	2.0E-01	mg/kg/day	1.7E-06
				CHLOROFORM	3.9E-03	ug/m3	1.3E-07	mg/kg/day	8.1E-02	mg/kg/day^{-1}	1.0E-08	3.6E-07	mg/kg/day	8.6E-02	mg/kg/day	4.2E-06
				DICHLORODIFLUOROMETHANE	2.1E+00	ug/m3	7.1E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-04	mg/kg/day	5.7E-02	mg/kg/day	3.5E-03
				HEXANE (N-HEXANE)	5.1E-03	ug/m3	1.7E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	4.8E-07	mg/kg/day	2.0E-01	mg/kg/day	2.4E-06
				TETRACHLOROETHENE	1.9E+01	ug/m3	6.3E-04	mg/kg/day	2.1E-02	mg/kg/day^{-1}	1.3E-05	1.8E-03	mg/kg/day	1.0E-02	mg/kg/day	1.8E-01
				TRICHLOROETHENE	1.1E+01	ug/m3	3.6E-04	mg/kg/day	7.0E-03	mg/kg/day^{-1}	2.5E-06	1.0E-03	mg/kg/day	1.7E-01	mg/kg/day	5.9E-03
				TRICHLOROFLUOROMETHANE (FREON 11)	1.5E+02	ug/m3	4.9E-03	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-02	mg/kg/day	2.0E-01	mg/kg/day	6.9E-02
			Exp. Route Total								1.6E-05					6.5E-01
		Exposure Point Total									1.6E-05					6.5E-01
Soil Gas Total											1.6E-05					6.5E-01
										Total of Receptor Risks Across All Media	1.6E-05				Total of Receptor Hazards Across All Media	6.5E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A3-7.3A - Parcel Site, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	8.9E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	6.2E-05	mg/kg/day	2.8E-01	mg/kg/day	2.2E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	4.2E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	2.9E-05	mg/kg/day	3.0E-01	mg/kg/day	9.8E-05
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	4.2E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	3.0E-06	mg/kg/day	5.0E-02	mg/kg/day	5.9E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	5.4E-09	mg/kg/day	9.1E-02	mg/kg/day^{-1}	4.9E-10	3.8E-07	mg/kg/day	2.0E-02	mg/kg/day	1.9E-05
				1,4-DIOXANE	1.6E+01	mg/kg	5.4E-08	mg/kg/day	2.7E-02	mg/kg/day^{-1}	1.4E-09	3.7E-06	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	1.8E-09	mg/kg/day	NA	mg/kg/day^{-1}	---	1.3E-07	mg/kg/day	4.0E-03	mg/kg/day	3.2E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	7.0E-09	mg/kg/day	1.2E+00	mg/kg/day^{-1}	8.4E-09	4.9E-07	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	5.4E-09	mg/kg/day	1.2E+01	mg/kg/day^{-1}	6.4E-08	3.8E-07	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.1E-09	mg/kg/day	1.2E+00	mg/kg/day^{-1}	3.7E-09	2.1E-07	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	5.1E-08	mg/kg/day	1.4E-02	mg/kg/day^{-1}	7.2E-10	3.6E-06	mg/kg/day	2.0E-02	mg/kg/day	1.8E-04
				CHROMIUM	7.7E+01	mg/kg	2.6E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	1.8E-05	mg/kg/day	1.5E+00	mg/kg/day	1.2E-05
				CHROMIUM VI	1.1E+01	mg/kg	3.7E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.6E-06	mg/kg/day	3.0E-03	mg/kg/day	8.6E-04
				DIELDRIN	3.5E-02	mg/kg	1.2E-10	mg/kg/day	1.6E+01	mg/kg/day^{-1}	1.9E-09	8.2E-09	mg/kg/day	5.0E-05	mg/kg/day	1.6E-04
				IRON	2.3E+04	mg/kg	7.8E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	5.4E-03	mg/kg/day	3.0E-01	mg/kg/day	1.8E-02
				LEAD	5.4E+01	mg/kg	1.8E-07	mg/kg/day	8.5E-03	mg/kg/day^{-1}	1.5E-09	1.3E-05	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	7.1E-08	mg/kg/day	1.4E-02	mg/kg/day^{-1}	1.0E-09	5.0E-06	mg/kg/day	6.0E-02	mg/kg/day	8.3E-05
				NAPHTHALENE	9.9E-01	mg/kg	3.3E-09	mg/kg/day	1.2E-01	mg/kg/day^{-1}	4.0E-10	2.3E-07	mg/kg/day	2.0E-02	mg/kg/day	1.2E-05
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	2.7E-10	mg/kg/day	5.0E+00	mg/kg/day^{-1}	1.4E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	9.6E-04
				PHENANTHRENE	2.4E+00	mg/kg	8.0E-09	mg/kg/day	NA	mg/kg/day^{-1}	---	5.6E-07	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.1E-06	mg/kg/day	5.4E-01	mg/kg/day^{-1}	5.8E-07	7.5E-05	mg/kg/day	1.0E-02	mg/kg/day	7.5E-03
				TOLUENE	1.3E+01	mg/kg	4.4E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	3.1E-06	mg/kg/day	8.0E-02	mg/kg/day	3.8E-05
				TRICHLOROETHENE	3.0E+01	mg/kg	1.0E-07	mg/kg/day	1.3E-02	mg/kg/day^{-1}	1.3E-09	7.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.4E-02
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.6E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-05	mg/kg/day	3.0E-01	mg/kg/day	3.7E-05
			Exp. Route Total								6.62E-07					5.2E-02

TABLE A3-7.3A - Parcel Site, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
			Dermal	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	7.6E-04	mg/kg/day	2.8E+00	mg/kg/day	2.7E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	5.1E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	3.6E-04	mg/kg/day	3.0E+00	mg/kg/day	1.2E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	5.2E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.6E-05	mg/kg/day	5.0E-01	mg/kg/day	7.2E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	9.1E-03	mg/kg/day^{-1}	6.0E-10	4.6E-06	mg/kg/day	2.0E-01	mg/kg/day	2.3E-05
				1,4-DIOXANE	1.6E+01	mg/kg	6.5E-07	mg/kg/day	8.1E-04	mg/kg/day^{-1}	5.3E-10	4.6E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	2.2E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-06	mg/kg/day	4.0E-02	mg/kg/day	3.9E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	8.5E-08	mg/kg/day	1.8E-01	mg/kg/day^{-1}	1.5E-08	6.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	1.8E+00	mg/kg/day^{-1}	1.2E-07	4.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.7E-08	mg/kg/day	1.8E-01	mg/kg/day^{-1}	6.7E-09	2.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	6.3E-07	mg/kg/day	1.4E-03	mg/kg/day^{-1}	8.8E-10	4.4E-05	mg/kg/day	2.0E-01	mg/kg/day	2.2E-04
				CHROMIUM	7.7E+01	mg/kg	3.2E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-04	mg/kg/day	1.5E+02	mg/kg/day	1.5E-06
				CHROMIUM VI	1.1E+01	mg/kg	4.5E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.2E-05	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	1.4E-09	mg/kg/day	8.0E-01	mg/kg/day^{-1}	1.1E-09	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	9.5E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.7E-02	mg/kg/day	3.0E+01	mg/kg/day	2.2E-03
				LEAD	5.4E+01	mg/kg	2.2E-06	mg/kg/day	8.5E-05	mg/kg/day^{-1}	1.9E-10	1.5E-04	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	8.7E-07	mg/kg/day	1.4E-03	mg/kg/day^{-1}	1.2E-09	6.1E-05	mg/kg/day	6.0E-01	mg/kg/day	1.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	4.1E-08	mg/kg/day	1.8E-02	mg/kg/day^{-1}	7.3E-10	2.8E-06	mg/kg/day	1.3E-01	mg/kg/day	2.1E-05
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	3.3E-09	mg/kg/day	7.5E-01	mg/kg/day^{-1}	2.5E-09	2.3E-07	mg/kg/day	1.3E-04	mg/kg/day	1.8E-03
				PHENANTHRENE	2.4E+00	mg/kg	9.8E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	6.8E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.3E-05	mg/kg/day	5.4E-02	mg/kg/day^{-1}	7.0E-07	9.1E-04	mg/kg/day	1.0E-01	mg/kg/day	9.1E-03
				TOLUENE	1.3E+01	mg/kg	5.4E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.8E-05	mg/kg/day	8.0E-01	mg/kg/day	4.7E-05
				TRICHLOROETHENE	3.0E+01	mg/kg	1.2E-06	mg/kg/day	1.3E-03	mg/kg/day^{-1}	1.6E-09	8.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.9E-02
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.9E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-04	mg/kg/day	3.0E+00	mg/kg/day	4.5E-05
			Exp. Route Total								8.52E-07					4.3E-02
		Exposure Point Total									1.51E-06					9.5E-02

TABLE A3-7.3A - Parcel Site, CTE

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
		Fugitive Dust	Inhalation	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.6E-10	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-08	mg/kg/day	2.8E+00	mg/kg/day	4.1E-09
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	7.7E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	5.4E-09	mg/kg/day	3.0E+00	mg/kg/day	1.8E-09
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	7.8E-12	mg/kg/day	NA	mg/kg/day^{-1}	---	5.5E-10	mg/kg/day	5.0E-01	mg/kg/day	1.1E-09
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	9.9E-13	mg/kg/day	9.1E-03	mg/kg/day^{-1}	9.0E-15	6.9E-11	mg/kg/day	2.0E-01	mg/kg/day	3.5E-10
				1,4-DIOXANE	1.6E+01	mg/kg	9.8E-12	mg/kg/day	8.1E-04	mg/kg/day^{-1}	8.0E-15	6.9E-10	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	3.3E-13	mg/kg/day	NA	mg/kg/day^{-1}	---	2.3E-11	mg/kg/day	4.0E-02	mg/kg/day	5.8E-10
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	1.3E-12	mg/kg/day	1.8E-01	mg/kg/day^{-1}	2.3E-13	9.0E-11	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	9.9E-13	mg/kg/day	1.8E+00	mg/kg/day^{-1}	1.8E-12	6.9E-11	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	5.6E-13	mg/kg/day	1.8E-01	mg/kg/day^{-1}	1.0E-13	3.9E-11	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	9.4E-12	mg/kg/day	1.4E-03	mg/kg/day^{-1}	1.3E-14	6.6E-10	mg/kg/day	2.0E-01	mg/kg/day	3.3E-09
				CHROMIUM	7.7E+01	mg/kg	4.8E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	3.3E-09	mg/kg/day	1.5E+02	mg/kg/day	2.2E-11
				CHROMIUM VI	1.1E+01	mg/kg	6.8E-12	mg/kg/day	NA	mg/kg/day^{-1}	---	4.8E-10	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	2.2E-14	mg/kg/day	8.0E-01	mg/kg/day^{-1}	1.7E-14	1.5E-12	mg/kg/day	1.0E-03	mg/kg/day	1.5E-09
				IRON	2.3E+04	mg/kg	1.4E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-06	mg/kg/day	3.0E+01	mg/kg/day	3.3E-08
				LEAD	5.4E+01	mg/kg	3.3E-11	mg/kg/day	8.5E-05	mg/kg/day^{-1}	2.8E-15	2.3E-09	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	1.3E-11	mg/kg/day	1.4E-03	mg/kg/day^{-1}	1.8E-14	9.2E-10	mg/kg/day	6.0E-01	mg/kg/day	1.5E-09
				NAPHTHALENE	9.9E-01	mg/kg	6.1E-13	mg/kg/day	1.8E-02	mg/kg/day^{-1}	1.1E-14	4.3E-11	mg/kg/day	1.3E-01	mg/kg/day	3.2E-10
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	5.0E-14	mg/kg/day	7.5E-01	mg/kg/day^{-1}	3.8E-14	3.5E-12	mg/kg/day	1.3E-04	mg/kg/day	2.6E-08
				PHENANTHRENE	2.4E+00	mg/kg	1.5E-12	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-10	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	2.0E-10	mg/kg/day	5.4E-02	mg/kg/day^{-1}	1.1E-11	1.4E-08	mg/kg/day	1.0E-01	mg/kg/day	1.4E-07
				TOLUENE	1.3E+01	mg/kg	8.1E-12	mg/kg/day	NA	mg/kg/day^{-1}	---	5.7E-10	mg/kg/day	8.0E-01	mg/kg/day	7.1E-10
				TRICHLOROETHENE	3.0E+01	mg/kg	1.9E-11	mg/kg/day	1.3E-03	mg/kg/day^{-1}	2.4E-14	1.3E-09	mg/kg/day	3.0E-03	mg/kg/day	4.3E-07
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	2.9E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-09	mg/kg/day	3.0E+00	mg/kg/day	6.8E-10
			Exp. Route Total								1.3E-11					6.5E-07
		Exposure Point Total									1.3E-11					6.5E-07
Soil Total											1.5E-06					9.5E-02
										Total of Receptor Risks Across All Media	1.5E-06				Total of Receptor Hazards Across All Media	9.5E-02

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

CTE: central tendency exposure

TABLE A3-7.4A - Parcel Site, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer Risk	Intake/ Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	4.3E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	3.0E-04	mg/kg/day	2.8E-01	mg/kg/day	1.1E-03
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	2.0E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-04	mg/kg/day	3.0E-01	mg/kg/day	4.7E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	2.0E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-05	mg/kg/day	5.0E-02	mg/kg/day	2.8E-04
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	2.6E-08	mg/kg/day	9.1E-02	mg/kg/day^{-1}	2.3E-09	1.8E-06	mg/kg/day	2.0E-02	mg/kg/day	9.0E-05
				1,4-DIOXANE	1.6E+01	mg/kg	2.6E-07	mg/kg/day	2.7E-02	mg/kg/day^{-1}	6.9E-09	1.8E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	8.7E-09	mg/kg/day	NA	mg/kg/day^{-1}	---	6.1E-07	mg/kg/day	4.0E-03	mg/kg/day	1.5E-04
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	3.3E-08	mg/kg/day	1.2E+00	mg/kg/day^{-1}	4.0E-08	2.3E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	2.6E-08	mg/kg/day	1.2E+01	mg/kg/day^{-1}	3.1E-07	1.8E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	1.5E-08	mg/kg/day	1.2E+00	mg/kg/day^{-1}	1.8E-08	1.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	2.5E-07	mg/kg/day	1.4E-02	mg/kg/day^{-1}	3.5E-09	1.7E-05	mg/kg/day	2.0E-02	mg/kg/day	8.6E-04
				CHROMIUM	7.7E+01	mg/kg	1.2E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	8.7E-05	mg/kg/day	1.5E+00	mg/kg/day	5.8E-05
				CHROMIUM VI	1.1E+01	mg/kg	1.8E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	1.2E-05	mg/kg/day	3.0E-03	mg/kg/day	4.1E-03
				DIELDRIN	3.5E-02	mg/kg	5.6E-10	mg/kg/day	1.6E+01	mg/kg/day^{-1}	9.0E-09	4.0E-08	mg/kg/day	5.0E-05	mg/kg/day	7.9E-04
				IRON	2.3E+04	mg/kg	3.7E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	2.6E-02	mg/kg/day	3.0E-01	mg/kg/day	8.7E-02
				LEAD	5.4E+01	mg/kg	8.6E-07	mg/kg/day	8.5E-03	mg/kg/day^{-1}	7.3E-09	6.1E-05	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	3.4E-07	mg/kg/day	1.4E-02	mg/kg/day^{-1}	4.8E-09	2.4E-05	mg/kg/day	6.0E-02	mg/kg/day	4.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	1.6E-08	mg/kg/day	1.2E-01	mg/kg/day^{-1}	1.9E-09	1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.6E-05
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	1.3E-09	mg/kg/day	5.0E+00	mg/kg/day^{-1}	6.6E-09	9.2E-08	mg/kg/day	2.0E-05	mg/kg/day	4.6E-03
				PHENANTHRENE	2.4E+00	mg/kg	3.8E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	2.7E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	5.1E-06	mg/kg/day	5.4E-01	mg/kg/day^{-1}	2.8E-06	3.6E-04	mg/kg/day	1.0E-02	mg/kg/day	3.6E-02
				TOLUENE	1.3E+01	mg/kg	2.1E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-05	mg/kg/day	8.0E-02	mg/kg/day	1.8E-04
				TRICHLOROETHENE	3.0E+01	mg/kg	4.9E-07	mg/kg/day	1.3E-02	mg/kg/day^{-1}	6.3E-09	3.4E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	7.6E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	5.3E-05	mg/kg/day	3.0E-01	mg/kg/day	1.8E-04
			Exp. Route Total								3.18E-06					2.5E-01

TABLE A3-7.4A - Parcel Site, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
			Dermal	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	mg/kg/day^{-1}	---	7.6E-04	mg/kg/day	2.8E+00	mg/kg/day	2.7E-04
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	5.1E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	3.6E-04	mg/kg/day	3.0E+00	mg/kg/day	1.2E-04
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	5.2E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.6E-05	mg/kg/day	5.0E-01	mg/kg/day	7.2E-05
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	9.1E-03	mg/kg/day^{-1}	6.0E-10	4.6E-06	mg/kg/day	2.0E-01	mg/kg/day	2.3E-05
				1,4-DIOXANE	1.6E+01	mg/kg	6.5E-07	mg/kg/day	8.1E-04	mg/kg/day^{-1}	5.3E-10	4.6E-05	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	2.2E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.5E-06	mg/kg/day	4.0E-02	mg/kg/day	3.9E-05
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	8.5E-08	mg/kg/day	1.8E-01	mg/kg/day^{-1}	1.5E-08	6.0E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	6.6E-08	mg/kg/day	1.8E+00	mg/kg/day^{-1}	1.2E-07	4.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	3.7E-08	mg/kg/day	1.8E-01	mg/kg/day^{-1}	6.7E-09	2.6E-06	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	6.3E-07	mg/kg/day	1.4E-03	mg/kg/day^{-1}	8.8E-10	4.4E-05	mg/kg/day	2.0E-01	mg/kg/day	2.2E-04
				CHROMIUM	7.7E+01	mg/kg	3.2E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-04	mg/kg/day	1.5E+02	mg/kg/day	1.5E-06
				CHROMIUM VI	1.1E+01	mg/kg	4.5E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.2E-05	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	1.4E-09	mg/kg/day	8.0E-01	mg/kg/day^{-1}	1.1E-09	1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.0E-04
				IRON	2.3E+04	mg/kg	9.5E-04	mg/kg/day	NA	mg/kg/day^{-1}	---	6.7E-02	mg/kg/day	3.0E+01	mg/kg/day	2.2E-03
				LEAD	5.4E+01	mg/kg	2.2E-06	mg/kg/day	8.5E-05	mg/kg/day^{-1}	1.9E-10	1.5E-04	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	8.7E-07	mg/kg/day	1.4E-03	mg/kg/day^{-1}	1.2E-09	6.1E-05	mg/kg/day	6.0E-01	mg/kg/day	1.0E-04
				NAPHTHALENE	9.9E-01	mg/kg	4.1E-08	mg/kg/day	1.8E-02	mg/kg/day^{-1}	7.3E-10	2.8E-06	mg/kg/day	1.3E-01	mg/kg/day	2.1E-05
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	3.3E-09	mg/kg/day	7.5E-01	mg/kg/day^{-1}	2.5E-09	2.3E-07	mg/kg/day	1.3E-04	mg/kg/day	1.8E-03
				PHENANTHRENE	2.4E+00	mg/kg	9.8E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	6.8E-06	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	1.3E-05	mg/kg/day	5.4E-02	mg/kg/day^{-1}	7.0E-07	9.1E-04	mg/kg/day	1.0E-01	mg/kg/day	9.1E-03
				TOLUENE	1.3E+01	mg/kg	5.4E-07	mg/kg/day	NA	mg/kg/day^{-1}	---	3.8E-05	mg/kg/day	8.0E-01	mg/kg/day	4.7E-05
				TRICHLOROETHENE	3.0E+01	mg/kg	1.2E-06	mg/kg/day	1.3E-03	mg/kg/day^{-1}	1.6E-09	8.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.9E-02
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	1.9E-06	mg/kg/day	NA	mg/kg/day^{-1}	---	1.4E-04	mg/kg/day	3.0E+00	mg/kg/day	4.5E-05
			Exp. Route Total								8.5E-07					4.3E-02
		Exposure Point Total									4.0E-06					2.9E-01

TABLE A3-7.4A - Parcel Site, RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake		**Noncancer Intake**	
Surface Soil		**Surface Soil**	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
		Fugitive Dust	Inhalation	1,1,1-TRICHLOROETHANE	2.6E+02	mg/kg	3.1E-10	mg/kg/day	NA	mg/kg/day^{-1}	---	2.2E-08	mg/kg/day	2.8E+00	mg/kg/day	7.8E-09
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1.3E+02	mg/kg	1.5E-10	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-08	mg/kg/day	3.0E+00	mg/kg/day	3.5E-09
				1,1-DICHLOROETHENE	1.3E+01	mg/kg	1.5E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	1.0E-09	mg/kg/day	5.0E-01	mg/kg/day	2.1E-09
				1,2-DICHLOROETHANE	1.6E+00	mg/kg	1.9E-12	mg/kg/day	9.1E-03	mg/kg/day^{-1}	1.7E-14	1.3E-10	mg/kg/day	2.0E-01	mg/kg/day	6.6E-10
				1,4-DIOXANE	1.6E+01	mg/kg	1.9E-11	mg/kg/day	8.1E-04	mg/kg/day^{-1}	1.5E-14	1.3E-09	mg/kg/day	NA	mg/kg/day	NA
				2-METHYLNAPHTHALENE	5.4E-01	mg/kg	6.4E-13	mg/kg/day	NA	mg/kg/day^{-1}	---	4.5E-11	mg/kg/day	4.0E-02	mg/kg/day	1.1E-09
				BENZO(A)ANTHRACENE	2.1E+00	mg/kg	2.5E-12	mg/kg/day	1.8E-01	mg/kg/day^{-1}	4.4E-13	1.7E-10	mg/kg/day	NA	mg/kg/day	NA
				BENZO(A)PYRENE	1.6E+00	mg/kg	1.9E-12	mg/kg/day	1.8E+00	mg/kg/day^{-1}	3.4E-12	1.3E-10	mg/kg/day	NA	mg/kg/day	NA
				BENZO(B)FLUORANTHENE	9.1E-01	mg/kg	1.1E-12	mg/kg/day	1.8E-01	mg/kg/day^{-1}	1.9E-13	7.5E-11	mg/kg/day	NA	mg/kg/day	NA
				BIS(2-ETHYLHEXYL)PHTHALATE	1.5E+01	mg/kg	1.8E-11	mg/kg/day	1.4E-03	mg/kg/day^{-1}	2.5E-14	1.3E-09	mg/kg/day	2.0E-01	mg/kg/day	6.3E-09
				CHROMIUM	7.7E+01	mg/kg	9.1E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	6.4E-09	mg/kg/day	1.5E+02	mg/kg/day	4.3E-11
				CHROMIUM VI	1.1E+01	mg/kg	1.3E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	9.1E-10	mg/kg/day	NA	mg/kg/day	NA
				DIELDRIN	3.5E-02	mg/kg	4.2E-14	mg/kg/day	8.0E-01	mg/kg/day^{-1}	3.3E-14	2.9E-12	mg/kg/day	1.0E-03	mg/kg/day	2.9E-09
				IRON	2.3E+04	mg/kg	2.7E-08	mg/kg/day	NA	mg/kg/day^{-1}	---	1.9E-06	mg/kg/day	3.0E+01	mg/kg/day	6.4E-08
				LEAD	5.4E+01	mg/kg	6.4E-11	mg/kg/day	8.5E-05	mg/kg/day^{-1}	5.4E-15	4.4E-09	mg/kg/day	NA	mg/kg/day	NA
				METHYLENE CHLORIDE	2.1E+01	mg/kg	2.5E-11	mg/kg/day	1.4E-03	mg/kg/day^{-1}	3.5E-14	1.8E-09	mg/kg/day	6.0E-01	mg/kg/day	2.9E-09
				NAPHTHALENE	9.9E-01	mg/kg	1.2E-12	mg/kg/day	1.8E-02	mg/kg/day^{-1}	2.1E-14	8.2E-11	mg/kg/day	1.3E-01	mg/kg/day	6.2E-10
				PCB-1254 (AROCLOR 1254)	8.1E-02	mg/kg	9.6E-14	mg/kg/day	7.5E-01	mg/kg/day^{-1}	7.2E-14	6.7E-12	mg/kg/day	1.3E-04	mg/kg/day	5.1E-08
				PHENANTHRENE	2.4E+00	mg/kg	2.8E-12	mg/kg/day	NA	mg/kg/day^{-1}	---	2.0E-10	mg/kg/day	NA	mg/kg/day	NA
				TETRACHLOROETHENE	3.2E+02	mg/kg	3.8E-10	mg/kg/day	5.4E-02	mg/kg/day^{-1}	2.0E-11	2.6E-08	mg/kg/day	1.0E-01	mg/kg/day	2.6E-07
				TOLUENE	1.3E+01	mg/kg	1.6E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	1.1E-09	mg/kg/day	8.0E-01	mg/kg/day	1.4E-09
				TRICHLOROETHENE	3.0E+01	mg/kg	3.6E-11	mg/kg/day	1.3E-03	mg/kg/day^{-1}	4.6E-14	2.5E-09	mg/kg/day	3.0E-03	mg/kg/day	8.3E-07
				TRICHLOROFLUOROMETHANE (FREON 11)	4.7E+01	mg/kg	5.6E-11	mg/kg/day	NA	mg/kg/day^{-1}	---	3.9E-09	mg/kg/day	3.0E+00	mg/kg/day	1.3E-09
			Exp. Route Total								2.5E-11					1.2E-06
		Exposure Point Total									2.5E-11					1.2E-06
Soil Total											4.0E-06					2.9E-01
										Total of Receptor Risks Across All Media	4.0E-06				Total of Receptor Hazards Across All Media	2.9E-01

ND: Not Detected.

NS: Not selected as an exposure pathway.

na: The chemical is listed, value is not available.

ne: The compound has not been evaluated by EPA for evidence of human carcinogenicity.

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

RME: reasonable maximum exposure

TABLE A3-9.1A - Parcel Site, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface	Surface	2-METHYLNAPHTHALENE	---	---	NA	---	Pulmonary alveolar proteinosis	5.9E-05	7.7E-05	NA	1.4E-04
	Soil	Soil	BIS(2-ETHYLHEXYL)PHTHALATE	4.8E-08	6.3E-08	NA	1.1E-07	Inc. liver weight	4.8E-04	6.3E-04	NA	1.1E-03
	0'-3'	0'-3'	CHROMIUM	---	---	NA	---	None	3.2E-05	4.3E-06	NA	3.7E-05
			CHROMIUM VI	---	---	NA	---	None	2.7E-03	NA	NA	2.7E-03
			DIELDRIN	4.5E-08	3.0E-08	NA	7.4E-08	Liver	1.6E-04	1.0E-04	NA	2.6E-04
			IRON	---	---	NA	---		3.8E-02	5.0E-03	NA	4.3E-02
			LEAD	6.6E-08	8.7E-09	NA	7.5E-08		NA	NA	NA	---
			NAPHTHALENE	2.5E-08	5.0E-08	NA	7.5E-08	Dec. body weight in males	2.9E-05	5.8E-05	NA	8.7E-05
			PCB-1254 (AROCLOR 1254)	2.2E-07	4.4E-07	NA	6.6E-07	Ocular exudate	6.2E-03	1.2E-02	NA	1.8E-02
			PHENANTHRENE	---	---	NA	---		NA	NA	NA	---
			Chemical Total	4.0E-07	5.9E-07	NA	9.9E-07		4.7E-02	1.8E-02	NA	6.6E-02
		Exposure Point Total					9.9E-07					6.6E-02
	Exposure Medium Total						9.9E-07					6.6E-02
Surface Soil Total							9.9E-07					6.6E-02
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.8E-02	1.8E-02
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.3E-01	4.3E-01
			BENZENE	NA	NA	2.3E-05	2.3E-05	Dec. lymphocyte count	NA	NA	7.4E-02	7.4E-02
			CARBON TETRACHLORIDE	NA	NA	2.4E-06	2.4E-06	Liver lesions	NA	NA	3.9E-03	3.9E-03
			CHLOROFORM	NA	NA	4.6E-07	4.6E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.5E-03	3.5E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.8E-03	5.8E-03
			METHYLENE CHLORIDE	NA	NA	2.1E-05	2.1E-05		NA	NA	1.5E-01	1.5E-01
			TETRACHLOROETHENE	NA	NA	8.8E-06	8.8E-06	Liver toxicity in mice	NA	NA	1.2E-01	1.2E-01
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	1.5E+00	1.5E+00
			TRICHLOROETHENE	NA	NA	8.6E-07	8.6E-07		NA	NA	2.0E-03	2.0E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	2.9E-03	2.9E-03
			Chemical Total	NA	NA	5.6E-05	5.6E-05		NA	NA	2.3E+00	2.3E+00
		Exposure Point Total					5.6E-05					2.3E+00
	Exposure Medium Total						5.6E-05					2.3E+00
Indoor Air Total							5.6E-05					2.3E+00
Receptor Total							5.7E-05					2.4E+00

Total Risk Across All Media=	6E-05	Total Hazard Across All Media =	2.4E+00
		Total Liver HI Across All Media =	1.5E-01
		Total Blood HI Across All Media =	7.4E-02
		Total Kidney HI Across All Media =	1.9E+00
		Total Other HI Across All Media =	2.1E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.1B - Parcel North, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	9.9E-03	9.9E-03
			1,4-DICHLOROBENZENE	NA	NA	7.3E-07	7.3E-07		NA	NA	2.2E-04	2.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	2.4E-01	2.4E-01
			BENZENE	NA	NA	2.4E-06	2.4E-06	Dec. lymphocyte count	NA	NA	8.0E-03	8.0E-03
			CARBON TETRACHLORIDE	NA	NA	2.8E-06	2.8E-06	Liver lesions	NA	NA	4.7E-03	4.7E-03
			CHLOROFORM	NA	NA	6.4E-07	6.4E-07	Liver	NA	NA	2.6E-04	2.6E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.4E-03	3.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	1.9E-04	1.9E-04
			METHYLENE CHLORIDE	NA	NA	3.9E-07	3.9E-07		NA	NA	2.8E-03	2.8E-03
			TETRACHLOROETHENE	NA	NA	1.1E-05	1.1E-05	Liver toxicity in mice	NA	NA	1.5E-01	1.5E-01
			TRICHLOROETHENE	NA	NA	2.2E-06	2.2E-06		NA	NA	5.1E-03	5.1E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	3.7E-03	3.7E-03
			Chemical Total	NA	NA	2.0E-05	2.0E-05		NA	NA	4.2E-01	4.2E-01
		Exposure Point Total					2.0E-05					4.2E-01
	Exposure Medium Total						2.0E-05					4.2E-01
Indoor Air Total							2.0E-05					4.2E-01
Receptor Total							2.0E-05					4.2E-01

Total Risk Across All Media=	2E-05	Total Hazard Across All Media =	4.2E-01
		Total Liver HI Across All Media =	1.6E-01
		Total Blood HI Across All Media =	8.0E-03
		Total Kidney HI Across All Media =	2.4E-01
		Total Other HI Across All Media =	1.5E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.1C - Parcel West, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.6E-02	2.6E-02
			1,4-DICHLOROBENZENE	NA	NA	2.8E-07	2.8E-07		NA	NA	8.5E-05	8.5E-05
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.1E-03	3.1E-03
			BENZENE	NA	NA	3.3E-06	3.3E-06	Dec. lymphocyte count	NA	NA	1.1E-02	1.1E-02
			CARBON TETRACHLORIDE	NA	NA	2.4E-06	2.4E-06	Liver lesions	NA	NA	3.9E-03	3.9E-03
			CHLOROFORM	NA	NA	4.6E-07	4.6E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.3E-03	3.3E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	3.5E-04	3.5E-04
			METHYLENE CHLORIDE	NA	NA	1.2E-07	1.2E-07		NA	NA	8.5E-04	8.5E-04
			TETRACHLOROETHENE	NA	NA	4.9E-05	4.9E-05	Liver toxicity in mice	NA	NA	6.6E-01	6.6E-01
			TRICHLOROETHENE	NA	NA	7.0E-07	7.0E-07		NA	NA	1.6E-03	1.6E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	2.2E-03	2.2E-03
			Chemical Total	NA	NA	5.6E-05	5.6E-05		NA	NA	7.1E-01	7.1E-01
		Exposure Point Total					5.6E-05					7.1E-01
	Exposure Medium Total						5.6E-05					7.1E-01
Indoor Air Total							5.6E-05					7.1E-01
Receptor Total							5.6E-05					7.1E-01

Total Risk Across All Media=	6E-05	Total Hazard Across All Media =	7.1E-01
		Total Liver HI Across All Media =	6.7E-01
		Total Blood HI Across All Media =	1.1E-02
		Total Kidney HI Across All Media =	3.4E-03
		Total Other HI Across All Media =	3.3E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.1D - Parcel South - Bishop, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.6E-02	1.6E-02
			1,4-DICHLOROBENZENE	NA	NA	3.0E-07	3.0E-07		NA	NA	9.1E-05	9.1E-05
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.0E-03	3.0E-03
			BENZENE	NA	NA	2.9E-06	2.9E-06	Dec. lymphocyte count	NA	NA	9.5E-03	9.5E-03
			CARBON TETRACHLORIDE	NA	NA	2.0E-06	2.0E-06	Liver lesions	NA	NA	3.3E-03	3.3E-03
			CHLOROFORM	NA	NA	3.3E-07	3.3E-07	Liver	NA	NA	1.3E-04	1.3E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.4E-03	3.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	4.0E-04	4.0E-04
			METHYLENE CHLORIDE	NA	NA	1.4E-07	1.4E-07		NA	NA	9.7E-04	9.7E-04
			TETRACHLOROETHENE	NA	NA	1.4E-05	1.4E-05	Liver toxicity in mice	NA	NA	1.9E-01	1.9E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.2E-03	1.2E-03
			Chemical Total	NA	NA	2.0E-05	2.0E-05		NA	NA	2.3E-01	2.3E-01
		Exposure Point Total					2.0E-05					2.3E-01
	Exposure Medium Total						2.0E-05					2.3E-01
Indoor Air Total							2.0E-05					2.3E-01
Receptor Total							2.0E-05					2.3E-01

Total Risk Across All Media=	2E-05	Total Hazard Across All Media =	2.3E-01
		Total Liver HI Across All Media =	2.1E-01
		Total Blood HI Across All Media =	9.5E-03
		Total Kidney HI Across All Media =	3.4E-03
		Total Other HI Across All Media =	5.2E-03

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.1E - Parcel South - LA Carts/Oncology Care, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.3E-03	3.3E-03
			1,2-DICHLOROETHANE	NA	NA	6.6E-07	6.6E-07		NA	NA	1.4E-02	1.4E-02
			1,4-DICHLOROBENZENE	NA	NA	3.6E-07	3.6E-07		NA	NA	1.1E-04	1.1E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	8.4E-02	8.4E-02
			BENZENE	NA	NA	4.5E-06	4.5E-06	Dec. lymphocyte count	NA	NA	1.5E-02	1.5E-02
			CARBON TETRACHLORIDE	NA	NA	1.8E-06	1.8E-06	Liver lesions	NA	NA	2.9E-03	2.9E-03
			CHLOROFORM	NA	NA	1.2E-06	1.2E-06	Liver	NA	NA	4.8E-04	4.8E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.8E-03	3.8E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	4.1E-04	4.1E-04
			METHYLENE CHLORIDE	NA	NA	4.4E-07	4.4E-07		NA	NA	3.1E-03	3.1E-03
			TETRACHLOROETHENE	NA	NA	7.8E-07	7.8E-07	Liver toxicity in mice	NA	NA	1.1E-02	1.1E-02
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	4.3E-01	4.3E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	9.7E-04	9.7E-04
			Chemical Total	NA	NA	9.7E-06	9.7E-06		NA	NA	5.7E-01	5.7E-01
		Exposure Point Total					9.7E-06					5.7E-01
	Exposure Medium Total						9.7E-06					5.7E-01
Indoor Air Total							9.7E-06					5.7E-01
Receptor Total							9.7E-06					5.7E-01

Total Risk Across All Media=	1E-05	Total Hazard Across All Media =	5.7E-01
		Total Liver HI Across All Media =	1.8E-02
		Total Blood HI Across All Media =	1.5E-02
		Total Kidney HI Across All Media =	5.1E-01
		Total Other HI Across All Media =	2.2E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.1F - Parcel South, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil Gas	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.7E-01	2.7E-01
			1,2,4-TRIMETHYLBENZENE	NA	NA	---	---		NA	NA	1.2E-04	1.2E-04
			2,2,4-TRIMETHYLPENTANE	NA	NA	---	---		NA	NA	NA	---
			2-BUTANONE	NA	NA	---	---	Dec. offspring weight	NA	NA	9.5E-08	9.5E-08
			4-ETHYLTOLUENE	NA	NA	---	---		NA	NA	NA	---
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.9E-06	4.9E-06
			CARBON DISULFIDE	NA	NA	---	---	Fetal toxicity	NA	NA	1.2E-06	1.2E-06
			CHLOROFORM	NA	NA	7.2E-09	7.2E-09	Liver	NA	NA	2.9E-06	2.9E-06
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	2.4E-03	2.4E-03
			HEXANE (N-HEXANE)	NA	NA	---	---		NA	NA	1.7E-06	1.7E-06
			TETRACHLOROETHENE	NA	NA	9.0E-06	9.0E-06	Liver toxicity in mice	NA	NA	1.2E-01	1.2E-01
			TRICHLOROETHENE	NA	NA	1.8E-06	1.8E-06		NA	NA	4.1E-03	4.1E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	4.8E-02	4.8E-02
			Chemical Total	NA	NA	1.1E-05	1.1E-05		NA	NA	4.5E-01	4.5E-01
		Exposure Point Total					1.1E-05					4.5E-01
	Exposure Medium Total						1.1E-05					4.5E-01
Soil Gas Total							1.1E-05					4.5E-01
Receptor Total							1.1E-05					4.5E-01

Total Risk Across All Media=	1E-05	Total Hazard Across All Media =	4.5E-01
		Total Liver HI Across All Media =	2.7E-01
		Total Offspring HI Across All Media =	1.2E-06
		Total Kidney HI Across All Media =	4.9E-06
		Total Other HI Across All Media =	1.8E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.2A - Parcel Site, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface	Surface	2-METHYLNAPHTHALENE	---	---	NA	---	Pulmonary alveolar proteinosis	1.2E-04	7.7E-05	NA	1.9E-04
	Soil	Soil	BIS(2-ETHYLHEXYL)PHTHALATE	9.5E-08	6.3E-08	NA	1.6E-07	Inc. liver weight	9.5E-04	6.3E-04	NA	1.6E-03
	0'-3'	0'-3'	CHROMIUM	---	---	NA	---	None	6.5E-05	4.3E-06	NA	6.9E-05
			CHROMIUM VI	---	---	NA	---	None	5.4E-03	NA	NA	5.4E-03
			DIELDRIN	9.0E-08	3.0E-08	NA	1.2E-07	Liver	3.1E-04	1.0E-04	NA	4.2E-04
			IRON	---	---	NA	---		7.6E-02	5.0E-03	NA	8.1E-02
			LEAD	1.3E-07	8.7E-09	NA	1.4E-07		NA	NA	NA	---
			NAPHTHALENE	5.0E-08	5.0E-08	NA	1.0E-07	Dec. body weight in males	5.9E-05	5.8E-05	NA	1.2E-04
			PCB-1254 (AROCLOR 1254)	4.4E-07	4.4E-07	NA	8.8E-07	Ocular exudate	1.2E-02	1.2E-02	NA	2.5E-02
			PHENANTHRENE	---	---	NA	---		NA	NA	NA	---
			Chemical Total	8.1E-07	5.9E-07	NA	1.4E-06		9.5E-02	1.8E-02	NA	1.1E-01
		Exposure Point Total					1.4E-06					1.1E-01
	Exposure Medium Total						1.4E-06					1.1E-01
Surface Soil Total							1.4E-06					1.1E-01
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.6E-02	2.6E-02
			ACETONE	NA	NA	---	---	Kidney	NA	NA	6.2E-01	6.2E-01
			BENZENE	NA	NA	3.3E-05	3.3E-05	Dec. lymphocyte count	NA	NA	1.1E-01	1.1E-01
			CARBON TETRACHLORIDE	NA	NA	3.5E-06	3.5E-06	Liver lesions	NA	NA	5.7E-03	5.7E-03
			CHLOROFORM	NA	NA	6.6E-07	6.6E-07	Liver	NA	NA	2.7E-04	2.7E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.0E-03	5.0E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	8.4E-03	8.4E-03
			METHYLENE CHLORIDE	NA	NA	3.0E-05	3.0E-05		NA	NA	2.1E-01	2.1E-01
			TETRACHLOROETHENE	NA	NA	1.3E-05	1.3E-05	Liver toxicity in mice	NA	NA	1.7E-01	1.7E-01
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	2.2E+00	2.2E+00
			TRICHLOROETHENE	NA	NA	1.2E-06	1.2E-06		NA	NA	2.9E-03	2.9E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	4.2E-03	4.2E-03
			Chemical Total	NA	NA	8.1E-05	8.1E-05		NA	NA	3.3E+00	3.3E+00
		Exposure Point Total					8.1E-05					3.3E+00
	Exposure Medium Total						8.1E-05					3.3E+00
Indoor Air Total							8.1E-05					3.3E+00
Receptor Total							8.2E-05					3.4E+00

Total Risk Across All Media=	8E-05	Total Hazard Across All Media =	3.4E+00
		Total Liver HI Across All Media =	2.1E-01
		Total Blood HI Across All Media =	1.1E-01
		Total Kidney HI Across All Media =	2.8E+00
		Total Other HI Across All Media =	3.3E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.2B - Parcel North, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	1.4E-02	1.4E-02
			1,4-DICHLOROBENZENE	NA	NA	1.0E-06	1.0E-06		NA	NA	3.2E-04	3.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	3.5E-01	3.5E-01
			BENZENE	NA	NA	3.5E-06	3.5E-06	Dec. lymphocyte count	NA	NA	1.2E-02	1.2E-02
			CARBON TETRACHLORIDE	NA	NA	4.1E-06	4.1E-06	Liver lesions	NA	NA	6.7E-03	6.7E-03
			CHLOROFORM	NA	NA	9.2E-07	9.2E-07	Liver	NA	NA	3.7E-04	3.7E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.0E-03	5.0E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	2.7E-04	2.7E-04
			METHYLENE CHLORIDE	NA	NA	5.7E-07	5.7E-07		NA	NA	4.0E-03	4.0E-03
			TETRACHLOROETHENE	NA	NA	1.6E-05	1.6E-05	Liver toxicity in mice	NA	NA	2.1E-01	2.1E-01
			TRICHLOROETHENE	NA	NA	3.2E-06	3.2E-06		NA	NA	7.4E-03	7.4E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	5.3E-03	5.3E-03
			Chemical Total	NA	NA	2.9E-05	2.9E-05		NA	NA	6.1E-01	6.1E-01
		Exposure Point Total					2.9E-05					6.1E-01
	Exposure Medium Total						2.9E-05					6.1E-01
Indoor Air Total							2.9E-05					6.1E-01
Receptor Total							2.9E-05					6.1E-01

Total Risk Across All Media=	3E-05	Total Hazard Across All Media =	6.1E-01
		Total Liver HI Across All Media =	2.3E-01
		Total Blood HI Across All Media =	1.2E-02
		Total Kidney HI Across All Media =	3.5E-01
		Total Other HI Across All Media =	2.2E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.2C - Parcel West, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.7E-02	3.7E-02
			1,4-DICHLOROBENZENE	NA	NA	4.0E-07	4.0E-07		NA	NA	1.2E-04	1.2E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.5E-03	4.5E-03
			BENZENE	NA	NA	4.8E-06	4.8E-06	Dec. lymphocyte count	NA	NA	1.6E-02	1.6E-02
			CARBON TETRACHLORIDE	NA	NA	3.5E-06	3.5E-06	Liver lesions	NA	NA	5.7E-03	5.7E-03
			CHLOROFORM	NA	NA	6.6E-07	6.6E-07	Liver	NA	NA	2.7E-04	2.7E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	4.7E-03	4.7E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.1E-04	5.1E-04
			METHYLENE CHLORIDE	NA	NA	1.7E-07	1.7E-07		NA	NA	1.2E-03	1.2E-03
			TETRACHLOROETHENE	NA	NA	7.0E-05	7.0E-05	Liver toxicity in mice	NA	NA	9.6E-01	9.6E-01
			TRICHLOROETHENE	NA	NA	1.0E-06	1.0E-06		NA	NA	2.4E-03	2.4E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	3.2E-03	3.2E-03
			Chemical Total	NA	NA	8.1E-05	8.1E-05		NA	NA	1.0E+00	1.0E+00
		Exposure Point Total					8.1E-05					1.0E+00
	Exposure Medium Total						8.1E-05					1.0E+00
Indoor Air Total							8.1E-05					1.0E+00
Receptor Total							8.1E-05					1.0E+00

Total Risk Across All Media=	8E-05	Total Hazard Across All Media =	1.0E+00
		Total Liver HI Across All Media =	9.6E-01
		Total Blood HI Across All Media =	1.6E-02
		Total Kidney HI Across All Media =	5.0E-03
		Total Other HI Across All Media =	4.8E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.2D - Parcel South - Bishop, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	2.4E-02	2.4E-02
			1,4-DICHLOROBENZENE	NA	NA	4.3E-07	4.3E-07		NA	NA	1.3E-04	1.3E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	4.3E-03	4.3E-03
			BENZENE	NA	NA	4.2E-06	4.2E-06	Dec. lymphocyte count	NA	NA	1.4E-02	1.4E-02
			CARBON TETRACHLORIDE	NA	NA	2.9E-06	2.9E-06	Liver lesions	NA	NA	4.7E-03	4.7E-03
			CHLOROFORM	NA	NA	4.7E-07	4.7E-07	Liver	NA	NA	1.9E-04	1.9E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	4.9E-03	4.9E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	5.7E-04	5.7E-04
			METHYLENE CHLORIDE	NA	NA	2.0E-07	2.0E-07		NA	NA	1.4E-03	1.4E-03
			TETRACHLOROETHENE	NA	NA	2.0E-05	2.0E-05	Liver toxicity in mice	NA	NA	2.7E-01	2.7E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.7E-03	1.7E-03
			Chemical Total	NA	NA	2.8E-05	2.8E-05		NA	NA	3.3E-01	3.3E-01
		Exposure Point Total					2.8E-05					3.3E-01
	Exposure Medium Total						2.8E-05					3.3E-01
Indoor Air Total							2.8E-05					3.3E-01
Receptor Total							2.8E-05					3.3E-01

Total Risk Across All Media=	3E-05	Total Hazard Across All Media =	3.3E-01
		Total Liver HI Across All Media =	3.0E-01
		Total Blood HI Across All Media =	1.4E-02
		Total Kidney HI Across All Media =	4.9E-03
		Total Other HI Across All Media =	7.6E-03

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.2E - Parcel South - LA Carts/Oncology Care, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Indoor Air	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	4.8E-03	4.8E-03
			1,2-DICHLOROETHANE	NA	NA	9.5E-07	9.5E-07		NA	NA	2.1E-02	2.1E-02
			1,4-DICHLOROBENZENE	NA	NA	5.2E-07	5.2E-07		NA	NA	1.6E-04	1.6E-04
			ACETONE	NA	NA	---	---	Kidney	NA	NA	1.2E-01	1.2E-01
			BENZENE	NA	NA	6.4E-06	6.4E-06	Dec. lymphocyte count	NA	NA	2.1E-02	2.1E-02
			CARBON TETRACHLORIDE	NA	NA	2.6E-06	2.6E-06	Liver lesions	NA	NA	4.3E-03	4.3E-03
			CHLOROFORM	NA	NA	1.7E-06	1.7E-06	Liver	NA	NA	7.0E-04	7.0E-04
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	5.4E-03	5.4E-03
			ETHYLBENZENE	NA	NA	---	---	Liver and kidney toxicity	NA	NA	6.0E-04	6.0E-04
			METHYLENE CHLORIDE	NA	NA	6.3E-07	6.3E-07		NA	NA	4.4E-03	4.4E-03
			TETRACHLOROETHENE	NA	NA	1.1E-06	1.1E-06	Liver toxicity in mice	NA	NA	1.5E-02	1.5E-02
			TOLUENE	NA	NA	---	---	Inc. kidney weight	NA	NA	6.2E-01	6.2E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	1.4E-03	1.4E-03
			Chemical Total	NA	NA	1.4E-05	1.4E-05		NA	NA	8.2E-01	8.2E-01
		Exposure Point Total					1.4E-05					8.2E-01
	Exposure Medium Total						1.4E-05					8.2E-01
Indoor Air Total							1.4E-05					8.2E-01
Receptor Total							1.4E-05					8.2E-01

Total Risk Across All Media= 1E-05

Total Hazard Across All Media = 8.2E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

Total Liver HI Across All Media =	2.6E-02
Total Blood HI Across All Media =	2.1E-02
Total Kidney HI Across All Media =	7.4E-01
Total Other HI Across All Media =	3.2E-02

TABLE A3-9.2F - Parcel South, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil Gas	Indoor Air	Indoor Air	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	NA	---	---	CNS	NA	NA	NA	---
			1,1-DICHLOROETHENE	NA	NA	---	---	Liver toxicity	NA	NA	3.9E-01	3.9E-01
			1,2,4-TRIMETHYLBENZENE	NA	NA	---	---		NA	NA	1.7E-04	1.7E-04
			2,2,4-TRIMETHYLPENTANE	NA	NA	---	---		NA	NA	NA	---
			2-BUTANONE	NA	NA	---	---	Dec. offspring weight	NA	NA	1.4E-07	1.4E-07
			4-ETHYLTOLUENE	NA	NA	---	---		NA	NA	NA	---
			ACETONE	NA	NA	---	---	Kidney	NA	NA	7.1E-06	7.1E-06
			CARBON DISULFIDE	NA	NA	---	---	Fetal toxicity	NA	NA	1.7E-06	1.7E-06
			CHLOROFORM	NA	NA	1.0E-08	1.0E-08	Liver	NA	NA	4.2E-06	4.2E-06
			DICHLORODIFLUOROMETHANE	NA	NA	---	---	Dec. body weight	NA	NA	3.5E-03	3.5E-03
			HEXANE (N-HEXANE)	NA	NA	---	---		NA	NA	2.4E-06	2.4E-06
			TETRACHLOROETHENE	NA	NA	1.3E-05	1.3E-05	Liver toxicity in mice	NA	NA	1.8E-01	1.8E-01
			TRICHLOROETHENE	NA	NA	2.5E-06	2.5E-06		NA	NA	5.9E-03	5.9E-03
			TRICHLOROFLUOROMETHANE (FREON 11)	NA	NA	---	---	Survival and histopathology	NA	NA	6.9E-02	6.9E-02
			Chemical Total	NA	NA	1.6E-05	1.6E-05		NA	NA	6.5E-01	6.5E-01
		Exposure Point Total					1.6E-05					6.5E-01
	Exposure Medium Total						1.6E-05					6.5E-01
Soil Gas Total							1.6E-05					6.5E-01
Receptor Total							1.6E-05					6.5E-01

Total Risk Across All Media=	2E-05	Total Hazard Across All Media =	6.5E-01
		Total Liver HI Across All Media =	3.9E-01
		Total Offspring HI Across All Media =	1.8E-06
		Total Kidney HI Across All Media =	7.1E-06
		Total Other HI Across All Media =	2.6E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

TABLE A3-9.3A - Parcel Site, CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total
Soil	Soil 0 to 30'	Soil 0 to 30'	1,1,1-TRICHLOROETHANE	---	---	---	---		2.2E-04	2.7E-04	4.1E-09	4.9E-04
			1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	---	---	---	---	CNS	9.8E-05	1.2E-04	1.8E-09	2.2E-04
			1,1-DICHLOROETHENE	---	---	---	---	Liver toxicity	5.9E-05	7.2E-05	1.1E-09	1.3E-04
			1,2-DICHLOROETHANE	4.9E-10	6.0E-10	9.0E-15	1.1E-09		1.9E-05	2.3E-05	3.5E-10	4.2E-05
			1,4-DIOXANE	1.4E-09	5.3E-10	8.0E-15	2.0E-09		NA	NA	NA	---
			2-METHYLNAPHTHALENE	---	---	---	---	Pulmonary alveolar proteinosis	3.2E-05	3.9E-05	5.8E-10	7.0E-05
			BENZO(A)ANTHRACENE	8.4E-09	1.5E-08	2.3E-13	2.4E-08		NA	NA	NA	---
			BENZO(A)PYRENE	6.4E-08	1.2E-07	1.8E-12	1.8E-07		NA	NA	NA	---
			BENZO(B)FLUORANTHENE	3.7E-09	6.7E-09	1.0E-13	1.0E-08		NA	NA	NA	---
			BIS(2-ETHYLHEXYL)PHTHALATE	7.2E-10	8.8E-10	1.3E-14	1.6E-09	Inc. liver weight	1.8E-04	2.2E-04	3.3E-09	4.0E-04
			CHROMIUM	---	---	---	---	None	1.2E-05	1.5E-06	2.2E-11	1.4E-05
			CHROMIUM VI	---	---	---	---	None	8.6E-04	NA	NA	8.6E-04
			DIELDRIN	1.9E-09	1.1E-09	1.7E-14	3.0E-09	Liver	1.6E-04	1.0E-04	1.5E-09	2.7E-04
			IRON	---	---	---	---		1.8E-02	2.2E-03	3.3E-08	2.0E-02
			LEAD	1.5E-09	1.9E-10	2.8E-15	1.7E-09		NA	NA	NA	---
			METHYLENE CHLORIDE	1.0E-09	1.2E-09	1.8E-14	2.2E-09		8.3E-05	1.0E-04	1.5E-09	1.9E-04
			NAPHTHALENE	4.0E-10	7.3E-10	1.1E-14	1.1E-09	Dec. body weight in males	1.2E-05	2.1E-05	3.2E-10	3.3E-05
			PCB-1254 (AROCLOR 1254)	1.4E-09	2.5E-09	3.8E-14	3.9E-09	Ocular exudate	9.6E-04	1.8E-03	2.6E-08	2.7E-03
			PHENANTHRENE	---	---	---	---		NA	NA	NA	---
			TETRACHLOROETHENE	5.8E-07	7.0E-07	1.1E-11	1.3E-06	Liver toxicity in mice	7.5E-03	9.1E-03	1.4E-07	1.7E-02
			TOLUENE	---	---	---	---	Inc. kidney weight	3.8E-05	4.7E-05	7.1E-10	8.5E-05
			TRICHLOROETHENE	1.3E-09	1.6E-09	2.4E-14	2.9E-09		2.4E-02	2.9E-02	4.3E-07	5.2E-02
			TRICHLOROFLUOROMETHANE (FREON 11)	---	---	---	---	Survival and histopathology	3.7E-05	4.5E-05	6.8E-10	8.2E-05
			Chemical Total	6.6E-07	8.5E-07	1.3E-11	1.5E-06		5.2E-02	4.3E-02	6.5E-07	9.5E-02
		Exposure Point Total					1.5E-06					9.5E-02
	Exposure Medium Total						1.5E-06					9.5E-02
Surface Soil Total							1.5E-06					9.5E-02
Receptor Total							1.5E-06					9.5E-02

Total Risk Across All Media=	2E-06	Total Hazard Across All Media =	9.5E-02
		Total Liver HI Across All Media =	1.7E-02
		Total Kidney HI Across All Media =	8.5E-05
		Total CNS HI Across All Media =	2.2E-04
		Total Other HI Across All Media =	7.7E-02

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.
CTE: central tendency exposure

TABLE A3-9.4A - Parcel Site, RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Total
Soil	Soil 0 to 30'	Soil 0 to 30'	1,1,1-TRICHLOROETHANE	---	---	---	---		1.1E-03	2.7E-04	7.8E-09	1.3E-03
			1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	---	---	---	---	CNS	4.7E-04	1.2E-04	3.5E-09	5.9E-04
			1,1-DICHLOROETHENE	---	---	---	---	Liver toxicity	2.8E-04	7.2E-05	2.1E-09	3.6E-04
			1,2-DICHLOROETHANE	2.3E-09	6.0E-10	1.7E-14	2.9E-09		9.0E-05	2.3E-05	6.6E-10	1.1E-04
			1,4-DIOXANE	6.9E-09	5.3E-10	1.5E-14	7.5E-09		NA	NA	NA	---
			2-METHYLNAPHTHALENE	---	---	---	---	Pulmonary alveolar proteinosis	1.5E-04	3.9E-05	1.1E-09	1.9E-04
			BENZO(A)ANTHRACENE	4.0E-08	1.5E-08	4.4E-13	5.5E-08		NA	NA	NA	---
			BENZO(A)PYRENE	3.1E-07	1.2E-07	3.4E-12	4.3E-07		NA	NA	NA	---
			BENZO(B)FLUORANTHENE	1.8E-08	6.7E-09	1.9E-13	2.4E-08		NA	NA	NA	---
			BIS(2-ETHYLHEXYL)PHTHALATE	3.5E-09	8.8E-10	2.5E-14	4.3E-09	Inc. liver weight	8.6E-04	2.2E-04	6.3E-09	1.1E-03
			CHROMIUM	---	---	---	---	None	5.8E-05	1.5E-06	4.3E-11	6.0E-05
			CHROMIUM VI	---	---	---	---	None	4.1E-03	NA	NA	4.1E-03
			DIELDRIN	9.0E-09	1.1E-09	3.3E-14	1.0E-08	Liver	7.9E-04	1.0E-04	2.9E-09	8.9E-04
			IRON	---	---	---	---		8.7E-02	2.2E-03	6.4E-08	8.9E-02
			LEAD	7.3E-09	1.9E-10	5.4E-15	7.5E-09		NA	NA	NA	---
			METHYLENE CHLORIDE	4.8E-09	1.2E-09	3.5E-14	6.0E-09		4.0E-04	1.0E-04	2.9E-09	5.0E-04
			NAPHTHALENE	1.9E-09	7.3E-10	2.1E-14	2.6E-09	Dec. body weight in males	5.6E-05	2.1E-05	6.2E-10	7.7E-05
			PCB-1254 (AROCLOR 1254)	6.6E-09	2.5E-09	7.2E-14	9.1E-09	Ocular exudate	4.6E-03	1.8E-03	5.1E-08	6.3E-03
			PHENANTHRENE	---	---	---	---		NA	NA	NA	---
			TETRACHLOROETHENE	2.8E-06	7.0E-07	2.0E-11	3.5E-06	Liver toxicity in mice	3.6E-02	9.1E-03	2.6E-07	4.5E-02
			TOLUENE	---	---	---	---	Inc. kidney weight	1.8E-04	4.7E-05	1.4E-09	2.3E-04
			TRICHLOROETHENE	6.3E-09	1.6E-09	4.6E-14	7.9E-09		1.1E-01	2.9E-02	8.3E-07	1.4E-01
			TRICHLOROFLUOROMETHANE (FREON 11)	---	---	---	---	Survival and histopathology	1.8E-04	4.5E-05	1.3E-09	2.2E-04
			Chemical Total	3.2E-06	8.5E-07	2.5E-11	4.0E-06		2.5E-01	4.3E-02	1.2E-06	2.9E-01
		Exposure Point Total					4.0E-06					2.9E-01
	Exposure Medium Total						4.0E-06					2.9E-01
Surface Soil Total							4.0E-06					2.9E-01
Receptor Total							4.0E-06					2.9E-01

Total Risk Across All Media=	4E-06	Total Hazard Across All Media =	2.9E-01
		Total Liver HI Across All Media =	4.7E-02
		Total Kidney HI Across All Media =	2.3E-04
		Total CNS HI Across All Media =	5.9E-04
		Total Other HI Across All Media =	2.4E-01

NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.
RME: reasonable maximum exposure

Appendix A-4
Johnson and Ettinger Model Calculations

Appendix A4-1
Summary of Johnson and Ettinger Model Results for
Soil Gas to Indoor Air - South Parcel - Skateland

CAS #	Chemical	Soil Gas Concentration ppbv	Soil Gas Concentration ppmv	Cbuilding ug/m3	Unit risk factor, URF $(\mu g/m^3)^{-1}$	CSF $(mg/kg/day)^{-1}$	Reference conc., RfC (mg/m^3)	RfD (mg/kg/day)
76131	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	330000	330.0000	6.45E+02	0.00E+00	0.00E+00	3.01E+01	8.60E+00
75354	1,1-DICHLOROETHENE	210000	210.0000	2.37E+02	0.00E+00	0.00E+00	7.00E-02	2.00E-02
95636	1,2,4-TRIMETHYLBENZENE	3	0.0030	3.08E-03	0.00E+00	0.00E+00	5.95E-03	1.70E-03
	2,2,4-TRIMETHYLPENTANE	12	0.0120					
78933	2-BUTANONE	2.6	0.0026	2.08E-03	0.00E+00	0.00E+00	5.00E+00	1.43E+00
	4-ETHYLTOLUENE	2.4	0.0024					
67641	ACETONE	78	0.0780	6.84E-02	0.00E+00	0.00E+00	3.50E-01	1.00E-01
75150	CARBON DISULFIDE	3.6	0.0036	3.54E-03	0.00E+00	0.00E+00	7.00E-01	2.00E-01
67663	CHLOROFORM	2.5	0.0025	3.86E-03	5.30E-06	1.86E-02	3.00E-01	8.57E-02
75718	DICHLORODIFLUOROMETHANE	1900	1.9000	2.11E+00	0.00E+00	0.00E+00	2.00E-01	5.71E-02
110543	HEXANE (N-HEXANE)	3	0.0030	5.10E-03	0.00E+00	0.00E+00	2.00E-01	5.71E-02
127184	TETRACHLOROETHENE	11592	11.5923	1.88E+01	5.90E-06	2.07E-02	3.50E-02	1.00E-02
79016	TRICHLOROETHENE	7800	7.8000	1.08E+01	2.00E-06	7.00E-03	6.00E-01	1.71E-01
75694	TRICHLOROFLUOROMETHANE (FREON 11)	94000	94.0000	1.46E+02	0.00E+00	0.00E+00	7.00E-01	2.00E-01

(1) Assumed an average soil temperature of 18oC per Figure A-1 in DTSC Indoor Air Guidance (Feb. 2005)
(2) Assumed the soil was clay
(3) Adjusted exposure frequency and duration to 250 days per year and 25 years typical for a commercial worker. Also added exposure time of 8 hrs/day.
(4) Default building size of 10 meters length, 10 meters width, and 9-foot (274.32 cm) ceiling height was used
(5) Building air exchange adjusted to 1 per hour for commercial building.

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
127184			1.16E+01	Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
15	152.4	18	152.4			C		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
C	1.43	0.459	0.215	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	40	1000	1000	274.32	0.1	1	5

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)
70	25	25	250	8

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	165.83	5.9E-06	3.5E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	137.4	0.244	0.244	0.244	0.324	2.29E-09	0.821	1.88E-09	4,000	8.05E+04	7.62E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	9,472	1.25E-02	5.23E-01	1.78E-04	3.12E-03	0.00E+00	0.00E+00	3.12E-03	137.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	8.05E+04	0.10	8.33E+01	3.12E-03	4.00E+02	#NUM!	2.34E-04	1.88E+01	5.9E-06	3.5E-02

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
9.1E-06	1.2E-01

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

Formulas were altered to incorporate exposure time

SCROLL DOWN TO "END"

END

VLOOKUP TABLES

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α_1 (1/cm)	N (unitless)	M (unitless)	n (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)	Bulk Density (g/cm^3)	θ_w (cm^3/cm^3)	SCS Soil Name
C	0.61	0.01496	1.253	0.2019	0.459	0.098	0.0092	1.43	0.215	Clay
CL	0.34	0.01581	1.416	0.2938	0.442	0.079	0.016	1.48	0.168	Clay Loam
L	0.50	0.01112	1.472	0.3207	0.399	0.061	0.020	1.59	0.148	Loam
LS	4.38	0.03475	1.746	0.4273	0.390	0.049	0.040	1.62	0.076	Loamy Sand
S	26.78	0.03524	3.177	0.6852	0.375	0.053	0.044	1.66	0.054	Sand
SC	0.47	0.03342	1.208	0.1722	0.385	0.117	0.025	1.63	0.197	Sandy Clay
SCL	0.55	0.02109	1.330	0.2481	0.384	0.063	0.029	1.63	0.146	Sandy Clay Loam
SI	1.82	0.00658	1.679	0.4044	0.489	0.050	0.0046	1.35	0.167	Silt
SIC	0.40	0.01622	1.321	0.2430	0.481	0.111	0.0039	1.38	0.216	Silty Clay
SICL	0.46	0.00839	1.521	0.3425	0.482	0.090	0.0056	1.37	0.198	Silty Clay Loam
SIL	0.76	0.00506	1.663	0.3987	0.439	0.065	0.011	1.49	0.180	Silt Loam
SL	1.60	0.02667	1.449	0.3099	0.387	0.039	0.030	1.62	0.103	Sandy Loam

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Molecular weight, MW (g/mol)	URF extrapolated (X)	RfC extrapolated (X)
56235	Carbon tetrachloride	1.74E+02	7.80E-02	8.80E-06	7.93E+02	1.24E+00	3.03E-02	25	349.90	556.60	7,127	4.2E-05	4.0E-02	1.54E+02		
57749	Chlordane	1.20E+05	1.18E-02	4.37E-06	5.60E-02	1.99E-03	4.85E-05	25	624.24	885.73	14,000	3.4E-04	7.0E-04	4.10E+02		
58899	gamma-HCH (Lindane)	1.07E+03	1.42E-02	7.34E-06	7.30E+00	5.73E-04	1.40E-05	25	596.55	839.36	15,000	3.1E-04	1.1E-03	2.91E+02	?	X
60297	Ethyl ether	5.73E+00	7.82E-02	8.61E-06	5.68E+04	1.35E+00	3.29E-02	25	307.50	466.74	6,338	0.0E+00	7.0E-01	7.41E+01		X
60571	Dieldrin	2.14E+04	1.25E-02	4.74E-06	1.95E-01	6.18E-04	1.51E-05	25	613.32	842.25	17,000	4.6E-03	1.8E-04	3.81E+02		X
67641	Acetone	5.75E-01	1.24E-01	1.14E-05	1.00E+06	1.59E-03	3.87E-05	25	329.20	508.10	6,955	0.0E+00	3.5E-01	5.81E+01		X
67663	Chloroform	3.98E+01	1.04E-01	1.00E-05	7.92E+03	1.50E-01	3.66E-03	25	334.32	536.40	6,988	5.3E-06	3.0E-01	1.19E+02		
67721	Hexachloroethane	1.78E+03	2.50E-03	6.80E-06	5.00E+01	1.59E-01	3.88E-03	25	458.00	695.00	9,510	1.1E-05	3.5E-03	2.37E+02		X
71432	Benzene	5.89E+01	8.80E-02	9.80E-06	1.79E+03	2.27E-01	5.54E-03	25	353.24	562.16	7,342	**2.9E-05**	3.0E-02	7.81E+01		
71556	1,1,1-Trichloroethane	1.10E+02	7.80E-02	8.80E-06	1.33E+03	7.03E-01	1.72E-02	25	347.24	545.00	7,136	0.0E+00	1.0E+00	1.33E+02		
72435	Methoxychlor	9.77E+04	1.56E-02	4.46E-06	1.00E-01	6.46E-04	1.58E-05	25	651.02	848.49	16,000	0.0E+00	1.8E-02	3.46E+02		X
72559	DDE	4.47E+06	1.44E-02	5.87E-06	1.20E-01	8.59E-04	2.09E-05	25	636.44	860.38	15,000	9.7E-05	0.0E+00	3.18E+02	?	
74839	Methyl bromide	1.05E+01	7.28E-02	1.21E-05	1.52E+04	2.55E-01	6.22E-03	25	276.71	467.00	5,714	0.0E+00	5.0E-03	9.49E+01		
74873	Methyl chloride (chloromethane)	2.12E+00	1.26E-01	6.50E-06	5.33E+03	3.61E-01	8.80E-03	25	249.00	416.25	5,115	1.0E-06	9.0E-02	5.05E+01		
74908	Hydrogen cyanide	3.80E+00	1.93E-01	2.10E-05	1.00E+06	5.44E-03	1.33E-04	25	299.00	456.70	6,676	0.0E+00	3.0E-03	2.70E+01		
74953	Methylene bromide	1.26E+01	4.30E-02	8.44E-06	1.19E+04	3.52E-02	8.59E-04	25	370.00	583.00	7,868	0.0E+00	3.5E-02	1.74E+02		X
75003	Chloroethane (ethyl chloride)	4.40E+00	2.71E-01	1.15E-05	5.68E+03	3.61E-01	8.80E-03	25	285.30	460.40	5,879	8.3E-07	1.0E+01	6.45E+01	X	
75014	Vinyl chloride (chloroethene)	1.86E+01	1.06E-01	1.23E-05	8.80E+03	1.10E+00	2.69E-02	25	259.25	432.00	5,250	7.8E-05	1.0E-01	6.25E+01		
75058	Acetonitrile	4.20E+00	1.28E-01	1.66E-05	1.00E+06	1.42E-03	3.45E-05	25	354.60	545.50	7,110	0.0E+00	6.0E-02	4.11E+01		
75070	Acetaldehyde	1.06E+00	1.24E-01	1.41E-05	1.00E+06	3.23E-03	7.87E-05	25	293.10	466.00	6,157	2.7E-06	9.0E-03	4.41E+01		
75092	Methylene chloride	1.17E+01	1.01E-01	1.17E-05	1.30E+04	8.96E-02	2.18E-03	25	313.00	510.00	6,706	1.0E-06	4.0E-01	8.49E+01		
75150	Carbon disulfide	4.57E+01	1.04E-01	1.00E-05	1.19E+03	1.24E+00	3.02E-02	25	319.00	552.00	6,391	0.0E+00	7.0E-01	7.61E+01		
75218	Ethylene oxide	1.33E+00	1.04E-01	1.45E-05	3.04E+05	2.27E-02	5.54E-04	25	283.60	469.00	6,104	8.8E-05	3.0E-02	4.41E+01		
75252	Bromoform	8.71E+01	1.49E-02	1.03E-05	3.10E+03	2.41E-02	5.88E-04	25	422.35	696.00	9,479	1.1E-06	7.0E-02	2.53E+02		X
75274	Bromodichloromethane	5.50E+01	2.98E-02	1.06E-05	6.74E+03	6.54E-02	1.60E-03	25	363.15	585.85	7,800	3.7E-05	7.0E-02	1.64E+02	?	X
75296	2-Chloropropane	9.14E+00	8.88E-02	1.01E-05	3.73E+03	5.93E-01	1.45E-02	25	308.70	485.00	6,286	0.0E+00	1.0E-01	7.85E+01		
75343	1,1-Dichloroethane	3.16E+01	7.42E-02	1.05E-05	5.06E+03	2.30E-01	5.61E-03	25	330.55	523.00	6,895	1.6E-06	5.0E-01	9.90E+01		
75354	1,1-Dichloroethylene	5.89E+01	9.00E-02	1.04E-05	2.25E+03	1.07E+00	2.60E-02	25	304.75	576.05	6,247	0.0E+00	7.0E-02	9.69E+01		
75456	Chlorodifluoromethane	4.79E+01	1.01E-01	1.28E-05	2.00E+00	1.10E+00	2.70E-02	25	232.40	369.30	4,836	0.0E+00	5.0E+01	8.65E+01		
75694	Trichlorofluoromethane	4.97E+02	8.70E-02	9.70E-06	1.10E+03	3.97E+00	9.68E-02	25	296.70	471.00	5,999	0.0E+00	7.0E-01	1.37E+02		
75718	Dichlorodifluoromethane	4.57E+02	6.65E-02	9.92E-06	2.80E+02	1.40E+01	3.42E-01	25	243.20	384.95	9,421	0.0E+00	2.0E-01	1.21E+02		
76131	1,1,2-Trichloro-1,2,2-trifluoroetha	1.11E+04	7.80E-02	8.20E-06	1.70E+02	1.97E+01	4.80E-01	25	320.70	487.30	6,463	0.0E+00	3.0E+01	1.87E+02		
76448	Heptachlor	1.41E+06	1.12E-02	5.69E-06	1.80E-01	6.05E+01	1.48E+00	25	603.69	846.31	13,000	1.6E-03	1.8E-03	3.73E+02		X
77474	Hexachlorocyclopentadiene	2.00E+05	1.61E-02	7.21E-06	1.80E+00	1.10E+00	2.69E-02	25	512.15	746.00	10,931	0.0E+00	2.0E-04	2.73E+02		
78831	Isobutanol	2.59E+00	8.60E-02	9.30E-06	8.50E+04	4.83E-04	1.18E-05	25	381.04	547.78	10,936	0.0E+00	1.1E+00	7.41E+01		X
78875	1,2-Dichloropropane	4.37E+01	7.82E-02	8.73E-06	2.80E+03	1.15E-01	2.79E-03	25	369.52	572.00	7,590	1.0E-05	4.0E-03	1.13E+02	?	
78933	Methylethylketone (2-butanone)	2.30E+00	8.08E-02	9.80E-06	2.23E+05	2.29E-03	5.58E-05	25	352.50	536.78	7,481	0.0E+00	5.0E+00	7.21E+01		
79005	1,1,2-Trichloroethane	5.01E+01	7.80E-02	8.80E-06	4.42E+03	3.73E-02	9.11E-04	25	386.15	602.00	8,322	1.6E-05	1.4E-02	1.33E+02		X
79016	Trichloroethylene	1.66E+02	7.90E-02	9.10E-06	1.47E+03	4.21E-01	1.03E-02	25	360.36	544.20	7,505	2.0E-06	6.0E-01	1.31E+02	?	
79209	Methyl acetate	3.26E+00	1.04E-01	1.00E-05	2.00E+03	4.84E-03	1.18E-04	25	329.80	506.70	7,260	0.0E+00	3.5E+00	7.41E+01		X
79345	1,1,2,2-Tetrachloroethane	9.33E+01	7.10E-02	7.90E-06	2.96E+03	1.41E-02	3.44E-04	25	419.60	661.15	8,996	5.8E-05	2.1E-01	1.68E+02		X
79469	2-Nitropropane	1.17E+01	9.23E-02	1.01E-05	1.70E+04	5.03E-03	1.23E-04	25	393.20	594.00	8,383	2.7E-03	2.0E-02	8.91E+01		
80626	Methylmethacrylate	6.98E+00	7.70E-02	8.60E-06	1.50E+04	1.38E-02	3.36E-04	25	373.50	567.00	8,975	0.0E+00	7.0E-01	1.00E+02		
83329	Acenaphthene	7.08E+03	4.21E-02	7.69E-06	3.57E+00	6.34E-03	1.55E-04	25	550.54	803.15	12,155	0.0E+00	2.1E-01	1.54E+02		X
86737	Fluorene	1.38E+04	3.63E-02	7.88E-06	1.98E+00	2.60E-03	6.34E-05	25	570.44	870.00	12,666	0.0E+00	1.4E-01	1.66E+02		X
87683	Hexachloro-1,3-butadiene	5.37E+04	5.61E-02	6.16E-06	3.20E+00	3.33E-01	8.13E-03	25	486.15	738.00	10,206	2.2E-05	7.0E-04	2.61E+02		X
88722	o-Nitrotoluene	3.24E+02	5.87E-02	8.67E-06	6.50E+02	5.11E-04	1.25E-05	25	495.00	720.00	12,239	0.0E+00	3.5E-02	1.37E+02		X
91203	Naphthalene	2.00E+03	5.90E-02	7.50E-06	3.10E+01	1.98E-02	4.82E-04	25	491.14	748.40	10,373	3.4E-05	3.0E-03	1.28E+02		
91576	2-Methylnaphthalene	2.81E+03	5.22E-02	7.75E-06	2.46E+01	2.12E-02	5.17E-04	25	514.26	761.00	12,600	0.0E+00	7.0E-02	1.42E+02		X
92524	Biphenyl	4.38E+03	4.04E-02	8.15E-06	7.45E+00	1.23E-02	2.99E-04	25	529.10	789.00	10,890	0.0E+00	1.8E-01	1.54E+02		X
95476	o-Xylene	3.63E+02	8.70E-02	1.00E-05	1.78E+02	2.12E-01	5.18E-03	25	417.60	630.30	8,661	0.0E+00	1.0E-01	1.06E+02		?
95501	1,2-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	1.56E+02	7.77E-02	1.90E-03	25	453.57	705.00	9,700	0.0E+00	2.0E-01	1.47E+02		

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Molecular weight, MW (g/mol)	URF extrapolated (X)	RfC extrapolated (X)
95578	2-Chlorophenol	3.88E+02	5.01E-02	9.46E-06	2.20E+04	1.60E-02	3.90E-04	25	447.53	675.00	9,572	0.0E+00	1.8E-02	1.29E+02		X
95636	1,2,4-Trimethylbenzene	1.35E+03	6.06E-02	7.92E-06	5.70E+01	2.52E-01	6.14E-03	25	442.30	649.17	9,369	0.0E+00	6.0E-03	1.20E+02		
96184	1,2,3-Trichloropropane	2.20E+01	7.10E-02	7.90E-06	1.75E+03	1.67E-02	4.08E-04	25	430.00	652.00	9,171	5.7E-04	4.9E-03	1.47E+02	X	
96333	Methyl acrylate	4.53E+00	9.76E-02	1.02E-05	6.00E+04	7.68E-03	1.87E-04	25	353.70	536.00	7,749	0.0E+00	1.1E-01	8.61E+01		X
97632	Ethylmethacrylate	2.95E+01	6.53E-02	8.37E-06	3.67E+03	3.44E-02	8.40E-04	25	390.00	571.00	10,957	0.0E+00	3.2E-01	1.14E+02		X
98066	tert-Butylbenzene	7.71E+02	5.65E-02	8.02E-06	2.95E+01	4.87E-01	1.19E-02	25	442.10	1220.00	8,980	0.0E+00	1.4E-01	1.34E+02		X
98828	Cumene	4.89E+02	6.50E-02	7.10E-06	6.13E+01	4.74E+01	1.16E+00	25	425.56	631.10	10,335	0.0E+00	4.0E-01	1.20E+02		
98862	Acetophenone	5.77E+01	6.00E-02	8.73E-06	6.13E+03	4.38E-04	1.07E-05	25	475.00	709.50	11,732	0.0E+00	3.5E-01	1.20E+02		X
98953	Nitrobenzene	6.46E+01	7.60E-02	8.60E-06	2.09E+03	9.82E-04	2.39E-05	25	483.95	719.00	10,566	0.0E+00	2.0E-03	1.23E+02		
100414	Ethylbenzene	3.63E+02	7.50E-02	7.80E-06	1.69E+02	3.22E-01	7.86E-03	25	409.34	617.20	8,501	0.0E+00	1.0E+00	1.06E+02		
100425	Styrene	7.76E+02	7.10E-02	8.00E-06	3.10E+02	1.12E-01	2.74E-03	25	418.31	636.00	8,737	0.0E+00	9.0E-01	1.04E+02		
100447	Benzylchloride	6.14E+01	7.50E-02	7.80E-06	5.25E+02	1.70E-02	4.14E-04	25	452.00	685.00	8,773	4.9E-05	0.0E+00	1.27E+02	?	
100527	Benzaldehyde	4.59E+01	7.21E-02	9.07E-06	3.30E+03	9.73E-04	2.37E-05	25	452.00	695.00	11,658	0.0E+00	3.5E-01	1.06E+02		X
103651	n-Propylbenzene	5.62E+02	6.01E-02	7.83E-06	6.00E+01	4.37E-01	1.07E-02	25	432.20	630.00	9,123	0.0E+00	1.4E-01	1.20E+02		X
104518	n-Butylbenzene	1.11E+03	5.70E-02	8.12E-06	2.00E+00	5.38E-01	1.31E-02	25	456.46	660.50	9,290	0.0E+00	1.4E-01	1.34E+02		X
106423	p-Xylene	3.89E+02	7.69E-02	8.44E-06	1.85E+02	3.13E-01	7.64E-03	25	411.52	616.20	8,525	0.0E+00	1.0E-01	1.06E+02		?
106467	1,4-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	7.90E+01	9.82E-02	2.39E-03	25	447.21	684.75	9,271	1.1E-05	8.0E-01	1.47E+02		
106934	1,2-Dibromoethane (ethylene dib	2.50E+01	2.17E-02	1.19E-05	4.18E+03	3.04E-02	7.41E-04	25	404.60	583.00	8,310	7.1E-05	8.0E-04	1.88E+02		
106990	1,3-Butadiene	1.91E+01	2.49E-01	1.08E-05	7.35E+02	3.01E+00	7.34E-02	25	268.60	425.00	5,370	1.7E-04	2.0E-03	5.41E+01		
107028	Acrolein	2.76E+00	1.05E-01	1.22E-05	2.13E+05	4.99E-03	1.22E-04	25	325.60	506.00	6,731	0.0E+00	2.0E-05	5.61E+01		
107062	1,2-Dichloroethane	1.74E+01	1.04E-01	9.90E-06	8.52E+03	4.00E-02	9.77E-04	25	356.65	561.00	7,643	2.1E-05	4.0E-01	9.90E+01		
107131	Acrylonitrile	5.90E+00	1.22E-01	1.34E-05	7.40E+04	4.21E-03	1.03E-04	25	350.30	519.00	7,786	2.9E-04	2.0E-03	5.31E+01		
108054	Vinyl acetate	5.25E+00	8.50E-02	9.20E-06	2.00E+04	2.09E-02	5.10E-04	25	345.65	519.13	7,800	0.0E+00	2.0E-01	8.61E+01		
108101	Methylisobutylketone (4-methyl-2	9.06E+00	7.50E-02	7.80E-06	1.90E+04	5.64E-03	1.38E-04	25	389.50	571.00	8,243	0.0E+00	8.0E-02	1.00E+02		
108383	m-Xylene	4.07E+02	7.00E-02	7.80E-06	1.61E+02	3.00E-01	7.32E-03	25	412.27	617.05	8,523	0.0E+00	1.0E-01	1.06E+02		?
108678	1,3,5-Trimethylbenzene	1.35E+03	6.02E-02	8.67E-06	2.00E+00	2.41E-01	5.87E-03	25	437.89	637.25	9,321	0.0E+00	6.0E-03	1.20E+02		
108872	Methylcyclohexane	7.85E+01	7.35E-02	8.52E-06	1.40E+01	4.22E+00	1.03E-01	25	373.90	572.20	7,474	0.0E+00	3.0E+00	9.82E+01		
108883	Toluene	1.82E+02	8.70E-02	8.60E-06	5.26E+02	2.72E-01	6.62E-03	25	383.78	591.79	7,930	0.0E+00	**3.0E-01**	9.21E+01		
108907	Chlorobenzene	2.19E+02	7.30E-02	8.70E-06	4.72E+02	1.51E-01	3.69E-03	25	404.87	632.40	8,410	0.0E+00	1.0E+00	1.13E+02		
109693	1-Chlorobutane	1.72E+01	8.26E-02	1.00E-05	1.10E+03	6.93E-01	1.69E-02	25	351.60	542.00	7,263	0.0E+00	1.4E+00	9.26E+01		X
109999	TETRAHYDROFURAN	1.00E+00	9.80E-02	1.05E-05	1.00E+06		4.90E-05	25	340.15	540.10	7,125	1.9E-06	3.0E-01	7.21E+01		
110009	Furan	1.86E+01	1.04E-01	1.22E-05	1.00E+04	2.21E-01	5.39E-03	25	304.60	490.20	6,477	0.0E+00	3.5E-03	6.81E+01		X
110543	Hexane	4.34E+01	2.00E-01	7.77E-06	1.24E+01	6.82E+01	1.66E+00	25	341.70	508.00	6,895	0.0E+00	2.0E-01	8.62E+01		
110827	CYCLOHEXANE		8.39E-02	9.10E-06	5.50E+01		1.37E-02	25	353.85	553.50	10,350	0.0E+00	6.0E+00	8.42E+01		
111444	Bis(2-chloroethyl)ether	1.55E+01	6.92E-02	7.53E-06	1.72E+04	7.36E-04	1.80E-05	25	451.15	659.79	10,803	7.1E-04	0.0E+00	1.43E+02		
115297	Endosulfan	2.14E+03	1.15E-02	4.55E-06	5.10E-01	4.58E-04	1.12E-05	25	674.43	942.94	14,000	0.0E+00	2.1E-02	4.07E+02		X
118741	Hexachlorobenzene	5.50E+04	5.42E-02	5.91E-06	5.00E-03	5.40E-02	1.32E-03	25	582.55	825.00	14,447	5.1E-04	2.8E-03	2.85E+02		X
120821	1,2,4-Trichlorobenzene	1.78E+03	3.00E-02	8.23E-06	4.88E+01	5.81E-02	1.42E-03	25	486.15	725.00	10,471	0.0E+00	2.0E-01	1.81E+02		
123739	Crotonaldehyde (2-butenal)	4.82E+00	9.56E-02	1.07E-05	3.69E+04	7.99E-04	1.95E-05	25	375.20	568.00	9	5.4E-04	0.0E+00	7.01E+01	X	
124481	Chlorodibromomethane	6.31E+01	1.96E-02	1.05E-05	2.60E+03	3.20E-02	7.81E-04	25	416.14	678.20	5,900	2.7E-05	7.0E-02	2.08E+02	?	X
126987	Methacrylonitrile	3.58E+01	1.12E-01	1.32E-05	2.54E+04	1.01E-02	2.46E-04	25	363.30	554.00	7,600	0.0E+00	7.0E-04	6.71E+01		
126998	2-Chloro-1,3-butadiene (chloropr	6.73E+01	8.58E-02	1.03E-05	2.12E+03	4.91E-01	1.20E-02	25	332.4	525	8074.848	0.0E+00	7.0E-03	8.85E+01		
127184	Tetrachloroethylene	1.55E+02	7.20E-02	8.20E-06	2.00E+02	7.53E-01	1.84E-02	25	394.4	620.2	8288	5.9E-06	3.5E-02	1.66E+02		
129000	Pyrene	1.05E+05	2.72E-02	7.24E-06	1.35E+00	4.50E-04	1.10E-05	25	667.95	936	14370	0.0E+00	1.1E-01	2.02E+02		X
132649	Dibenzofuran	5.15E+03	2.38E-02	6.00E-06	3.10E+00	5.15E-04	1.26E-05	25	560	824	66400	0.0E+00	1.4E-02	1.68E+02		X
135988	sec-Butylbenzene	9.66E+02	5.70E-02	8.12E-06	3.94E+00	5.68E-01	1.39E-02	25	446.5	679	88730	0.0E+00	1.4E-01	1.34E+02		X
141786	Ethylacetate	6.44E+00	7.32E-02	9.70E-06	8.03E+04	5.64E-03	1.38E-04	25	350.26	523.3	7633.66	0.0E+00	3.2E+00	8.81E+01		X
156592	cis-1,2-Dichloroethylene	3.55E+01	7.36E-02	1.13E-05	3.50E+03	1.67E-01	4.07E-03	25	333.65	544	7192	0.0E+00	3.5E-02	9.69E+01		X
156605	trans-1,2-Dichloroethylene	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.84E-01	9.36E-03	25	320.85	516.5	6717	0.0E+00	7.0E-02	9.69E+01		X
205992	Benzo(b)fluoranthene	1.23E+06	2.26E-02	5.56E-06	1.50E-03	4.54E-03	1.11E-04	25	715.9	969.27	17000	1.1E-04	0.0E+00	2.52E+02	?	
218019	Chrysene	3.98E+05	2.48E-02	6.21E-06	6.30E-03	3.87E-03	9.44E-05	25	714.15	979	16455	1.1E-05	0.0E+00	2.28E+02	?	
309002	Aldrin	2.45E+06	1.32E-02	4.86E-06	1.70E-02	6.95E-03	1.70E-04	25	603.01	839.37	15000	4.9E-03	1.1E-04	3.65E+02		X
319846	alpha-HCH (alpha-BHC)	1.23E+03	1.42E-02	7.34E-06	2.00E+00	4.34E-04	1.06E-05	25	596.55	839.36	15000	7.7E-04	0.0E+00	2.91E+02		
541731	1,3-Dichlorobenzene	1.98E+03	6.92E-02	7.86E-06	1.34E+02	1.27E-01	3.09E-03	25	446	684	9230.18	0.0E+00	1.1E-01	1.47E+02		X
542756	1,3-Dichloropropene	4.57E+01	6.26E-02	1.00E-05	2.80E+03	7.24E-01	1.77E-02	25	381.15	587.38	7900	1.6E-05	2.0E-02	1.11E+02		
630206	1,1,1,2-Tetrachloroethane	1.16E+02	7.10E-02	7.90E-06	1.10E+03	9.90E-02	2.41E-03	25	403.5	624	9768.282525	7.4E-06	1.1E-01	1.68E+02		X
1634044	MTBE	7.26E+00	1.02E-01	1.05E-05	5.10E+04	2.56E-02	6.23E-04	25	328.3	497.1	6677.66	2.6E-07	3.0E+00	8.82E+01		
7439976	Mercury (elemental)	5.20E+01	3.07E-02	6.30E-06	2.00E+01	4.40E-01	1.07E-02	25	629.88	1750	14127	0.0E+00	9.0E-05	2.01E+02		

Appendix A-5
HBRG Calculations

TABLE A5-1.1 CTE

CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs

Industrial Worker - Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake Factor		**Noncancer Intake Factor**	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target Risk	Target Hazard	Cancer Risk Calculations: Target Risk/Intake Factor Value	Target Risk/Intake Factor Units	CSF Value	CSF Units	Cancer HBRG	Non-Cancer Hazard Calculations: Target Hazard/Intake Factor Value	Target Hazard/Intake Factor Units	RfD Value	RfD Units	Hazard HBRG
Soil	Surface Soil	Surface Soil at Site	Ingestion	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	1.4E-02	mg/kg/day^{-1}	4.1E+02	2.0E+06	mg/kg/day^{-1}	2.0E-02	mg/kg/day	4.1E+04
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	5.0E+00	mg/kg/day^{-1}	1.1E+00	2.0E+06	mg/kg/day^{-1}	2.0E-05	mg/kg/day	4.1E+01
			Exp. Route Total		2.0E-06	2.0E+00										
			Dermal	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	1.4E-03	mg/kg/day^{-1}	3.1E+02	1.5E+05	mg/kg/day^{-1}	2.0E-01	mg/kg/day	3.1E+04
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	7.5E-01	mg/kg/day^{-1}	5.8E-01	1.5E+05	mg/kg/day^{-1}	1.3E-04	mg/kg/day	2.1E+01
			Exp. Route Total		2.0E-06	2.0E+00					mg/kg					mg/kg
		Exposure Point Total			4.0E-06	4.0E+00										
Surface Soil Total					4.0E-06	4E+00										
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1-DICHLOROETHENE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	5.7E-02	mg/kg/day	6.1E+02
				1,2-DICHLOROETHANE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	9.1E-02	mg/kg/day^{-1}	3.3E-01	1.1E+01	mg/kg/day^{-1}	1.4E-03	mg/kg/day	1.5E+01
				1,4-DICHLOROBENZENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	4.0E-02	mg/kg/day^{-1}	7.5E-01	1.1E+01	mg/kg/day^{-1}	2.3E-01	mg/kg/day	2.4E+03
				ACETONE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	9.0E-01	mg/kg/day	9.6E+03
				BENZENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	1.0E-01	mg/kg/day^{-1}	3.0E-01	1.1E+01	mg/kg/day^{-1}	8.6E-03	mg/kg/day	9.1E+01
				CARBON TETRACHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	1.5E-01	mg/kg/day^{-1}	2.0E-01	1.1E+01	mg/kg/day^{-1}	1.1E-02	mg/kg/day	1.2E+02
				CHLOROFORM	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	8.1E-02	mg/kg/day^{-1}	3.7E-01	1.1E+01	mg/kg/day^{-1}	8.6E-02	mg/kg/day	9.1E+02
				METHYLENE CHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	3.5E-03	mg/kg/day^{-1}	8.5E+00	1.1E+01	mg/kg/day^{-1}	1.1E-01	mg/kg/day	1.2E+03
				TETRACHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	2.1E-02	mg/kg/day^{-1}	1.4E+00	1.1E+01	mg/kg/day^{-1}	1.0E-02	mg/kg/day	1.1E+02
				TOLUENE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	8.6E-02	mg/kg/day	9.1E+02
				TRICHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	7.0E-03	mg/kg/day^{-1}	4.3E+00	1.1E+01	mg/kg/day^{-1}	1.7E-01	mg/kg/day	1.8E+03
			Exp. Route Total		8.0E-06	1.1E+01					ug/m^3					ug/m^3
		Exposure Point Total			8.0E-06	1E+01										
Indoor Air Total					8.0E-06	1E+01										
					#REF!	#REF!	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media				

NA: Not applicable.

HBRG: Health based risk goal

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A5-1.2 RME

CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs

Industrial Worker - Reasonable Maximum Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Cancer Intake Factor		**Noncancer Intake Factor**	
Surface Soil		**Surface Soil**	
Ingestion:	1.7E-07	Ingestion:	4.9E-07
Dermal:	2.3E-06	Dermal:	6.5E-06
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Groundwater		**Groundwater**	
Inhalation of soil vapor:	3.4E-02	Inhalation of soil vapor:	9.4E-02
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Target Risk/Intake Factor		CSF		Cancer	Target Hazard/Intake Factor		RfD		Hazard
					Risk	Hazard	Value	Units	Value	Units	HBRG	Value	Units	Value	Units	HBRG
Soil	Surface Soil	Surface Soil at Site	Ingestion	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	1.4E-02	mg/kg/day^{-1}	4.1E+02	2.0E+06	mg/kg/day^{-1}	2.0E-02	mg/kg/day	4.1E+04
				DIELDRIN	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	1.6E+01	mg/kg/day^{-1}	3.6E-01	2.0E+06	mg/kg/day^{-1}	5.0E-05	mg/kg/day	1.0E+02
				LEAD	1.0E-06	---	5.7E+00	mg/kg/day^{-1}	8.5E-03	mg/kg/day^{-1}	6.7E+02	---	mg/kg/day^{-1}	NA	mg/kg/day	---
				NAPHTHALENE	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	1.2E-01	mg/kg/day^{-1}	4.8E+01	2.0E+06	mg/kg/day^{-1}	2.0E-02	mg/kg/day	4.1E+04
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	5.7E+00	mg/kg/day^{-1}	5.0E+00	mg/kg/day^{-1}	1.1E+00	2.0E+06	mg/kg/day^{-1}	2.0E-05	mg/kg/day	4.1E+01
			Exp. Route Total		5.0E-06	4.0E+00										
			Dermal	BIS(2-ETHYLHEXYL)PHTHALATE	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	1.4E-03	mg/kg/day^{-1}	3.1E+02	1.5E+05	mg/kg/day^{-1}	2.0E-01	mg/kg/day	3.1E+04
				DIELDRIN	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	8.0E-01	mg/kg/day^{-1}	5.4E-01	1.5E+05	mg/kg/day^{-1}	1.0E-03	mg/kg/day	1.5E+02
				LEAD	1.0E-06	---	4.3E-01	mg/kg/day^{-1}	8.5E-05	mg/kg/day^{-1}	5.1E+03	---	mg/kg/day^{-1}	NA	mg/kg/day	---
				NAPHTHALENE	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	1.8E-02	mg/kg/day^{-1}	2.4E+01	1.5E+05	mg/kg/day^{-1}	1.3E-01	mg/kg/day	2.1E+04
				PCB-1254 (AROCLOR 1254)	1.0E-06	1	4.3E-01	mg/kg/day^{-1}	7.5E-01	mg/kg/day^{-1}	5.8E-01	1.5E+05	mg/kg/day^{-1}	1.3E-04	mg/kg/day	2.1E+01
			Exp. Route Total		5.0E-06	4.0E+00					mg/kg					mg/kg
		Exposure Point Total			1.0E-05	8.0E+00										
Surface Soil Total					1.0E-05	8E+00										
Indoor Air	Indoor Air	Indoor Air	Inhalation	1,1-DICHLOROETHENE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	5.7E-02	mg/kg/day	6.1E+02
				1,2-DICHLOROETHANE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	9.1E-02	mg/kg/day^{-1}	3.3E-01	1.1E+01	mg/kg/day^{-1}	1.4E-03	mg/kg/day	1.5E+01
				1,4-DICHLOROBENZENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	4.0E-02	mg/kg/day^{-1}	7.5E-01	1.1E+01	mg/kg/day^{-1}	2.3E-01	mg/kg/day	2.4E+03
				ACETONE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	9.0E-01	mg/kg/day	9.6E+03
				BENZENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	1.0E-01	mg/kg/day^{-1}	3.0E-01	1.1E+01	mg/kg/day^{-1}	8.6E-03	mg/kg/day	9.1E+01
				CARBON TETRACHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	1.5E-01	mg/kg/day^{-1}	2.0E-01	1.1E+01	mg/kg/day^{-1}	1.1E-02	mg/kg/day	1.2E+02
				CHLOROFORM	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	8.1E-02	mg/kg/day^{-1}	3.7E-01	1.1E+01	mg/kg/day^{-1}	8.6E-02	mg/kg/day	9.1E+02
				METHYLENE CHLORIDE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	3.5E-03	mg/kg/day^{-1}	8.5E+00	1.1E+01	mg/kg/day^{-1}	1.1E-01	mg/kg/day	1.2E+03
				TETRACHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	2.1E-02	mg/kg/day^{-1}	1.4E+00	1.1E+01	mg/kg/day^{-1}	1.0E-02	mg/kg/day	1.1E+02
				TOLUENE	---	1	---	mg/kg/day^{-1}	NA	mg/kg/day^{-1}	---	1.1E+01	mg/kg/day^{-1}	8.6E-02	mg/kg/day	9.1E+02
				TRICHLOROETHENE	1.0E-06	1	3.0E-05	mg/kg/day^{-1}	7.0E-03	mg/kg/day^{-1}	4.3E+00	1.1E+01	mg/kg/day^{-1}	1.7E-01	mg/kg/day	1.8E+03
			Exp. Route Total		8.0E-06	1.1E+01					ug/m^3					ug/m^3
		Exposure Point Total			8.0E-06	1E+01										
Indoor Air Total					8.0E-06	1E+01										
					1.8E-05	1.9E+01	Total of Receptor Hazards Across All Media					Total of Receptor Hazards Across All Media				

NA: Not applicable.

HBRG: Health based risk goal

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A5-1.3 CTE

CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs

Construction Worker - Central Tendency Exposure

Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor Age:	Adult

Cancer Intake Factor		**Noncancer Intake Factor**	
Surface Soil		**Surface Soil**	
Ingestion:	3.4E-09	Ingestion:	2.3E-07
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	6.2E-13	Inhalation of fugitive dust:	4.3E-11
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Target Risk/Intake Factor		CSF		Cancer	Target Risk/Intake Factor		RfD		Hazard
					Risk	Hazard	Value	Units	Value	Units	HBRG	Value	Units	Value	Units	HBRG
Soil	Surface and Subsurface Soil to 30' bgs	Surface and Subsurface Soil	Ingestion	BENZO(A)PYRENE	1.0E-06	---	3.0E+02	mg/kg/day	1.2E+01	mg/kg/day^{-1}	2.5E+01	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	3.0E+02	mg/kg/day	5.4E-01	mg/kg/day^{-1}	5.5E+02	4.3E+06	mg/kg/day	1.0E-02	mg/kg/day	4.3E+04
			Exp. Route Total		2.00E-06	1.00E+00					mg/kg					mg/kg
			Dermal	BENZO(A)PYRENE	1.0E-06	---	2.4E+01	mg/kg/day	1.8E+00	mg/kg/day^{-1}	1.4E+01	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	2.4E+01	mg/kg/day	5.4E-02	mg/kg/day^{-1}	4.5E+02	3.5E+05	mg/kg/day	1.0E-01	mg/kg/day	3.5E+04
			Exp. Route Total		2.00E-06	1.00E+00					mg/kg					mg/kg
		Exposure Point Total			4.00E-06	2.00E+00										
		Fugitive Dust	Inhalation	BENZO(A)PYRENE	1.0E-06	---	1.6E+06	mg/kg/day	1.8E+00	mg/kg/day^{-1}	9.0E+05	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	1.6E+06	mg/kg/day	5.4E-02	mg/kg/day^{-1}	3.0E+07	2.3E+10	mg/kg/day	1.0E-01	mg/kg/day	2.3E+09
			Exp. Route Total		2.0E-06	1.0E+00					mg/kg					mg/kg
		Exposure Point Total			2.0E-06	1.0E+00										
Soil Total					6.0E-06	3.0E+00										
					6.0E-06	3.0E+00	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media				

NA: Not applicable.

HBRG: Health based risk goal

CTE: central tendency exposure

---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.

mg/kg/day: milligram per kilogram per day.

mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A5-1.4 RME
CALCULATION OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs
Construction Worker - Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor Age:	Adult

Cancer Intake Factor		**Noncancer Intake Factor**	
Surface Soil		**Surface Soil**	
Ingestion:	1.6E-08	Ingestion:	1.1E-06
Dermal:	4.1E-08	Dermal:	2.9E-06
Inhalation of fugitive dust:	1.2E-12	Inhalation of fugitive dust:	8.3E-11
Target Risk	1.00E-06	Target Hazard Quotient	1

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Target		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/ Exposure Concentration		CSF		Cancer	Intake/ Exposure Concentration		RfD		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Surface	Surface	Ingestion	BENZO(A)PYRENE	1.0E-06	---	6.2E+01	mg/kg/day	1.2E+01	mg/kg/day^{-1}	5.2E+00	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	6.2E+01	mg/kg/day	5.4E-01	mg/kg/day^{-2}	1.2E+02	8.9E+05	mg/kg/day	1.0E-02	mg/kg/day	8.9E+03
	and	and		TRICHLOROETHENE	1.0E-06	1.0	6.2E+01	mg/kg/day	1.3E-02	mg/kg/day^{-1}	4.8E+03	8.9E+05	mg/kg/day	3.0E-04	mg/kg/day	2.7E+02
	Subsurface	Subsurface	Exp. Route Total		3.00E-06	2.00E+00					mg/kg					mg/kg
	Soil	Soil	Dermal	BENZO(A)PYRENE	1.0E-06	---	2.4E+01	mg/kg/day	1.8E+00	mg/kg/day^{-1}	1.4E+01	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	2.4E+01	mg/kg/day	5.4E-02	mg/kg/day^{-2}	4.5E+02	3.5E+05	mg/kg/day	1.0E-01	mg/kg/day	3.5E+04
	to 30' bgs			TRICHLOROETHENE	1.0E-06	1.0	2.4E+01	mg/kg/day	1.3E-03	mg/kg/day^{-1}	1.9E+04	3.5E+05	mg/kg/day	3.0E-03	mg/kg/day	1.0E+03
			Exp. Route Total		3.00E-06	2.00E+00					mg/kg					mg/kg
		Exposure Point Total			6.00E-06	4.00E+00										
		Fugitive Dust	Inhalation	BENZO(A)PYRENE	1.0E-06	---	8.4E+05	mg/kg/day	1.8E+00	mg/kg/day^{-1}	4.7E+05	---	mg/kg/day	NA	mg/kg/day	---
				TETRACHLOROETHENE	1.0E-06	1.0	8.4E+05	mg/kg/day	5.4E-02	mg/kg/day^{-2}	1.6E+07	1.2E+10	mg/kg/day	1.0E-01	mg/kg/day	1.2E+09
				TRICHLOROETHENE	1.0E-06	1.0	8.4E+05	mg/kg/day	1.3E-03	mg/kg/day^{-1}	6.5E+08	1.2E+10	mg/kg/day	3.0E-03	mg/kg/day	3.6E+07
			Exp. Route Total		3.0E-06	2.0E+00					mg/kg					mg/kg
		Exposure Point Total			3.0E-06	2.0E+00										
Soil Total					9.0E-06	6.0E+00										
					9.0E-06	6.0E+00	Total of Receptor Risks Across All Media					Total of Receptor Hazards Across All Media				

NA: Not applicable.
RME: reasonable maximum exposure
HBRG: Health based risk goal

---: Risk was not calculated for chemical.
mg/kg: milligram per kilogram.
mg/kg/day: milligram per kilogram per day.
mg/kg/day^{-1}: milligram per kilogram-day.

TABLE A5-2.1 CTE
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY
Industrial Worker - Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	Carcinogenic HBRG				Non-Carcinogenic Hazard HBRG					Minimum HBRG
					Ingestion	Dermal	Inhalation	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Min	
Soil	Surface Soil 0-1.5'	Surface Soil 0-1.5'	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.1E+02	3.1E+02	NA	3.1E+02	Inc. liver weight	4.1E+04	3.1E+04	NA	3.1E+04	3.1E+02
			PCB-1254 (AROCLOR 1254)	mg/kg	1.1E+00	5.8E-01	NA	5.8E-01	Ocular exudate	4.1E+01	2.1E+01	NA	2.1E+01	5.8E-01
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m^3	NA	NA	---	---	Liver toxicity	NA	NA	6.1E+02	6.1E+02	6.1E+02
			1,2-DICHLOROETHANE	ug/m^3	NA	NA	3.3E-01	3.3E-01		NA	NA	1.5E+01	1.5E+01	3.3E-01
			1,4-DICHLOROBENZENE	ug/m^3	NA	NA	7.5E-01	7.5E-01		NA	NA	2.4E+03	2.4E+03	7.5E-01
			ACETONE	ug/m^3	NA	NA	---	---	Kidney	NA	NA	9.6E+03	9.6E+03	9.6E+03
			BENZENE	ug/m^3	NA	NA	3.0E-01	3.0E-01	Dec. lymphocyte count	NA	NA	9.1E+01	9.1E+01	3.0E-01
			CARBON TETRACHLORIDE	ug/m^3	NA	NA	2.0E-01	2.0E-01	Liver lesions	NA	NA	1.2E+02	1.2E+02	2.0E-01
			CHLOROFORM	ug/m^3	NA	NA	3.7E-01	3.7E-01	Liver	NA	NA	9.1E+02	9.1E+02	3.7E-01
			METHYLENE CHLORIDE	ug/m^3	NA	NA	8.5E+00	8.5E+00		NA	NA	1.2E+03	1.2E+03	8.5E+00
			TETRACHLOROETHENE	ug/m^3	NA	NA	1.4E+00	1.4E+00	Liver toxicity in mice	NA	NA	1.1E+02	1.1E+02	1.4E+00
			TOLUENE	ug/m^3	NA	NA	---	---	Inc. kidney weight	NA	NA	9.1E+02	9.1E+02	9.1E+02
			TRICHLOROETHENE	ug/m^3	NA	NA	4.3E+00	4.3E+00		NA	NA	1.8E+03	1.8E+03	4.3E+00

HBRG: Health based risk goal
NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

mg/kg: milligram per kilogram.
ug/m^3: microgram per cubic meter.

TABLE A5-2.2 RME
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY
Industrial Worker - Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Industrial Worker
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	Carcinogenic HBRG				Non-Carcinogenic Hazard HBRG					Minimum HBRG
					Ingestion	Dermal	Inhalation	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation	Exposure Routes Min	
Soil	Surface Soil 0-1.5'	Surface Soil 0-1.5'	BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	4.1E+02	3.1E+02	NA	3.1E+02	Inc. liver weight	4.1E+04	3.1E+04	NA	3.1E+04	3.1E+02
			DIELDRIN	mg/kg	3.6E-01	5.4E-01	NA	3.6E-01	Liver	1.0E+02	1.5E+02	NA	1.0E+02	3.6E-01
			LEAD	mg/kg	6.7E+02	5.1E+03	NA	6.7E+02		---	---	NA	---	6.7E+02
			NAPHTHALENE	mg/kg	4.8E+01	2.4E+01	NA	2.4E+01	Dec. body weight in males	4.1E+04	2.1E+04	NA	2.1E+04	2.4E+01
			PCB-1254 (AROCLOR 1254)	mg/kg	1.1E+00	5.8E-01	NA	5.8E-01	Ocular exudate	4.1E+01	2.1E+01	NA	2.1E+01	5.8E-01
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m^3	NA	NA	---	---	Liver toxicity	NA	NA	6.1E+02	6.1E+02	6.1E+02
			1,2-DICHLOROETHANE	ug/m^3	NA	NA	3.3E-01	3.3E-01		NA	NA	1.5E+01	1.5E+01	3.3E-01
			1,4-DICHLOROBENZENE	ug/m^3	NA	NA	7.5E-01	7.5E-01		NA	NA	2.4E+03	2.4E+03	7.5E-01
			ACETONE	ug/m^3	NA	NA	---	---	Kidney	NA	NA	9.6E+03	9.6E+03	9.6E+03
			BENZENE	ug/m^3	NA	NA	3.0E-01	3.0E-01	Dec. lymphocyte count	NA	NA	9.1E+01	9.1E+01	3.0E-01
			CARBON TETRACHLORIDE	ug/m^3	NA	NA	2.0E-01	2.0E-01	Liver lesions	NA	NA	1.2E+02	1.2E+02	2.0E-01
			CHLOROFORM	ug/m^3	NA	NA	3.7E-01	3.7E-01	Liver	NA	NA	9.1E+02	9.1E+02	3.7E-01
			METHYLENE CHLORIDE	ug/m^3	NA	NA	8.5E+00	8.5E+00		NA	NA	1.2E+03	1.2E+03	8.5E+00
			TETRACHLOROETHENE	ug/m^3	NA	NA	1.4E+00	1.4E+00	Liver toxicity in mice	NA	NA	1.1E+02	1.1E+02	1.4E+00
			TOLUENE	ug/m^3	NA	NA	---	---	Inc. kidney weight	NA	NA	9.1E+02	9.1E+02	9.1E+02
			TRICHLOROETHENE	ug/m^3	NA	NA	4.3E+00	4.3E+00		NA	NA	1.8E+03	1.8E+03	4.3E+00

HBRG: Health based risk goal
NA: Not applicable.
---: Risk was not calculated for chemical.
HI: Hazard Index.
CNS: Central Nervous System.

mg/kg: milligram per kilogram.
ug/m^3: microgram per cubic meter.

TABLE A5-2.3 CTE
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY
Construction Worker - Central Tendency Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - CTE
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic HBRG (mg/kg)				Non-Carcinogenic Hazard HBRG (mg/kg)					Minimum HBRG
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	mg/kg
Soil	Soil	Soil	BENZO(A)PYRENE	2.5E+01	1.4E+01	9.0E+05	1.4E+01		---	---	---	---	1.4E+01
	0 to 30'	0 to 30'	TETRACHLOROETHENE	5.5E+02	4.5E+02	3.0E+07	4.5E+02	Liver toxicity in mice	4.3E+04	3.5E+04	2.3E+09	3.5E+04	4.5E+02

HBRG: Health based risk goal
NA: Not applicable.
---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.
CNS: Central Nervous System.
CTE: central tendency exposure

TABLE A5-2.4 RME
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs BY EXPOSURE PATHWAY
Construction Worker - Reasonable Maximum Exposure
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker - RME
Receptor:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic HBRG (mg/kg)				Non-Carcinogenic Hazard HBRG (mg/kg)					Minimum HBRG
				Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	Primary Target Organ(s)	Ingestion	Dermal	Inhalation of Fugitive Dust	Exposure Routes Min	mg/kg
Soil	Soil	Soil	BENZO(A)PYRENE	5.2E+00	1.4E+01	4.7E+05	5.2E+00		---	---	---	---	5.2E+00
	0 to 30'	0 to 30'	TETRACHLOROETHENE	1.2E+02	4.5E+02	1.6E+07	1.2E+02	Liver toxicity in mice	8.9E+03	3.5E+04	1.2E+09	8.9E+03	1.2E+02
			TRICHLOROETHENE	4.8E+03	1.9E+04	6.5E+08	4.8E+03		2.7E+02	1.0E+03	3.6E+07	2.7E+02	2.7E+02

HBRG: Health based risk goal
NA: Not applicable.
---: Risk was not calculated for chemical.

mg/kg: milligram per kilogram.
CNS: Central Nervous System.
RME: reasonable maximum exposure

TABLE A5-3.1 RME
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HBRGS FOR COPCs
All Receptors
Omega Chemical Site - Whittier, California

Scenario Timeframe:	Current/Future		
Receptor Population:	Industrial Worker and Construction Worker	Target Risk	1.0E-06
Receptor:	Adult	Target Hazard	1.0E+00

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Units	HBRG for Exposure Point					HBRG For Original Medium		Comparison of Calculated HBRG to Existing Screening Level(1)	
					Industrial CTE	Industrial RME	Construction CTE	Construction RME	Receptor Minimum	Value	Units	Screening Level	Notes
Soil	Soil	Soil	BENZO(A)PYRENE	mg/kg	NA	NA	1.4E+01	5.2E+00	5.2E+00	5.2E+00	mg/kg	2.11E-01	OK
			BIS(2-ETHYLHEXYL)PHTHALATE	mg/kg	3.1E+02	3.1E+02	NA	NA	3.1E+02	3.1E+02	mg/kg	1.23E+02	OK
			DIELDRIN	mg/kg	NA	3.6E-01	NA	NA	3.6E-01	3.6E-01	mg/kg	1.08E-01	OK
			LEAD	mg/kg	NA	6.7E+02	NA	NA	6.7E+02	6.7E+02	mg/kg	8.00E+02	PRG less stringent
			NAPHTHALENE	mg/kg	NA	2.4E+01	NA	NA	2.4E+01	2.4E+01	mg/kg	4.20E+00	OK
			PCB-1254 (AROCLOR 1254)	mg/kg	5.8E-01	5.8E-01	NA	NA	5.8E-01	5.8E-01	mg/kg	7.44E-01	PRG less stringent
			TETRACHLOROETHENE	mg/kg	NA	NA	4.5E+02	1.2E+02	1.2E+02	1.2E+02	mg/kg	1.31E+00	OK
			TRICHLOROETHENE	mg/kg	NA	NA	NA	2.7E+02	2.7E+02	2.7E+02	mg/kg	6.47E+00	OK
Indoor Air	Indoor Air	Indoor Air	1,1-DICHLOROETHENE	ug/m^3	6.1E+02	6.1E+02	NA	NA	6.1E+02	6.1E+02	ug/m^3	---	No CHHSL
			1,2-DICHLOROETHANE	ug/m^3	3.3E-01	3.3E-01	NA	NA	3.3E-01	3.3E-01	ug/m^3	1.95E-01	OK
			1,4-DICHLOROBENZENE	ug/m^3	7.5E-01	7.5E-01	NA	NA	7.5E-01	7.5E-01	ug/m^3	---	No CHHSL
			ACETONE	ug/m^3	9.6E+03	9.6E+03	NA	NA	9.6E+03	9.6E+03	ug/m^3	---	No CHHSL
			BENZENE	ug/m^3	3.0E-01	3.0E-01	NA	NA	3.0E-01	3.0E-01	ug/m^3	1.41E-01	OK
			CARBON TETRACHLORIDE	ug/m^3	2.0E-01	2.0E-01	NA	NA	2.0E-01	2.0E-01	ug/m^3	9.73E-02	OK
			CHLOROFORM	ug/m^3	3.7E-01	3.7E-01	NA	NA	3.7E-01	3.7E-01	ug/m^3	---	No CHHSL
			METHYLENE CHLORIDE	ug/m^3	8.5E+00	8.5E+00	NA	NA	8.5E+00	8.5E+00	ug/m^3	---	No CHHSL
			TETRACHLOROETHENE	ug/m^3	1.4E+00	1.4E+00	NA	NA	1.4E+00	1.4E+00	ug/m^3	6.93E-01	OK
			TOLUENE	ug/m^3	9.1E+02	9.1E+02	NA	NA	9.1E+02	9.1E+02	ug/m^3	4.38E+02	OK
			TRICHLOROETHENE	ug/m^3	4.3E+00	4.3E+00	NA	NA	4.3E+00	4.3E+00	ug/m^3	2.04E+00	OK

NA: Not applicable, not a COPC for the pathway or the receptor scenario
OK: indicates that HBRG is higher than screening level
HBRG: Health based risk goal
CHHSL: California Human Health Screening Level
PRG: Preliminary Remediation Goal
ug/m^3: microgram per cubic meter.
ppbv: parts per billion by volume
ug/l: microgram per liter.

(1) Screening Levels were as follows:
Indoor air screening levels are CalEPA CHHSLs Indoor Air Screening Levels for Human Health Commercial/Industrial Use (EPA 2005).
Soil screening levels are EPA's Region 9 Preliminary Remediation Goals (PRGs) for industrial soil (EPA 2004c)

Appendix B
Arsenic Statistical Evaluation

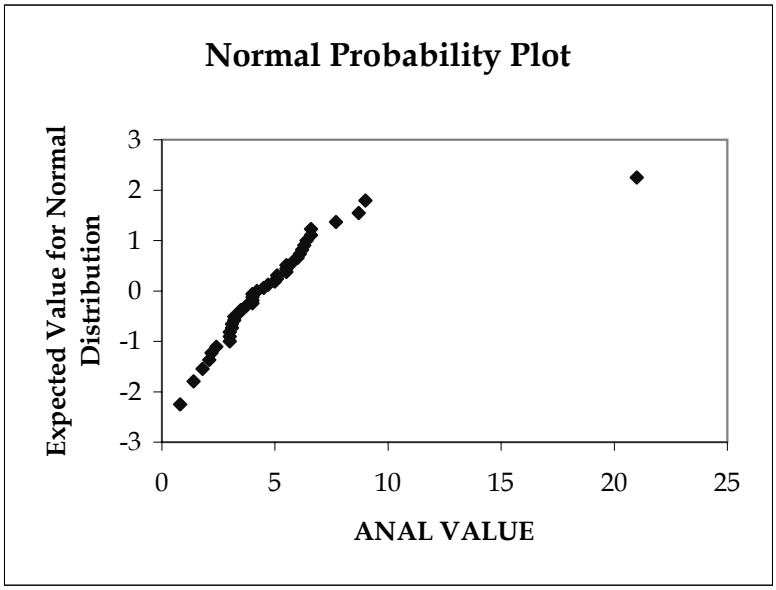
PARAM_NAME	SAMPLE_ID	FROM_DEPTH	UNITS	VALUE	ANAL VALUE
ARSENIC	RT2526-110803		mg/kg	2.40	2.40
ARSENIC	SB-1-3.0-SOIL-12/12/1995	3	ug/Kg	3200.00	3.20
ARSENIC	SB-2-1.8-SOIL-12/11/1995	1.8	ug/Kg	3700.00	3.70
ARSENIC	SB-3-1.7-SOIL-12/12/1995	1.7	ug/Kg	3400.00	3.40
ARSENIC	SB-4-1.6-SOIL-12/11/1995	1.6	ug/Kg	4000.00	4.00
ARSENIC	SB-5-1.8-SOIL-12/11/1995	1.8	ug/Kg	4700.00	4.70
ARSENIC	SB-6-2.1-SOIL-12/12/1995	2.1	ug/Kg	4500.00	4.50
ARSENIC	SB-7-1.7-SOIL-12/11/1995	1.7	ug/Kg	4200.00	4.20
ARSENIC	SB-8-2.1-SOIL-12/12/1995	2.1	ug/Kg	3100.00	3.10
ARSENIC	SB-9-1.8-SOIL-12/13/1995	1.8	ug/Kg	1800.00	1.80
ARSENIC	SB-9-5.9-SOIL-12/13/1995	5.9	ug/Kg	810.00	0.81
ARSENIC	12/14/1995	2.2	ug/Kg	1400.00	1.40
ARSENIC	12/14/1995	1.8	ug/Kg	2100.00	2.10
ARSENIC	12/14/1995	6.5	ug/Kg	2200.00	2.20
ARSENIC	12/11/1995	1.7	ug/Kg	9000.00	9.00
ARSENIC	12/11/1995	6.5	ug/Kg	3100.00	3.10
ARSENIC	12/12/1995	1.8	ug/Kg	3500.00	3.50
ARSENIC	12/11/1995	1.8	ug/Kg	6600.00	6.60
ARSENIC	12/11/1995	1.7	ug/Kg	3200.00	3.20
ARSENIC	OCSS-000-01-040504	0	mg/kg	21.00	21.00
ARSENIC	OCSS-000-02-040504	0	mg/kg	6.00	6.00
ARSENIC	OCSS-000-03-040504	0	mg/kg	3.00	3.00
ARSENIC	OC1-000-04-S-0-5	0.5	mg/Kg	5.50	5.50
ARSENIC	OC-SS-000-04-040504	0	mg/kg	3.00	3.00
ARSENIC	OCSS-000-05-040504	0	mg/kg	3.00	3.00
ARSENIC	OCSS-000-06-040504	0	mg/kg	8.70	8.70
ARSENIC	OCSS-000-07-040504	0	mg/kg	6.60	6.60
ARSENIC	OCSS-000-08-040504	0	mg/kg	6.40	6.40
ARSENIC	OC-SS-000-09-040504	0	mg/kg	5.50	5.50
ARSENIC	OC-SS-000-10-040504	0	mg/kg	4.00	4.00
ARSENIC	OC-SS-000-11-040504	0	mg/kg	6.20	6.20
ARSENIC	OC1-000-12-S-0-7	0.5	mg/Kg	6.30	6.30
ARSENIC	OC-SS-000-12-040504	0	mg/kg	5.00	5.00
ARSENIC	OC-SS-000-13-040504	0	mg/kg	7.70	7.70
ARSENIC	OC-SS-000-14-040504	0	mg/kg	5.80	5.80
ARSENIC	OC-SS-000-15-040504	0	mg/kg	4.00	4.00
ARSENIC	OC-SS-000-16-040504	0	mg/kg	6.10	6.10
ARSENIC	OC-SS-000-17-040604	0	mg/kg	5.10	5.10
ARSENIC	OC-SS-000-18-040604	0	mg/kg	5.50	5.50
ARSENIC	OC-SS-000-19-040604	0	mg/kg	5.10	5.10
ARSENIC	OC-SS-000-20-040604	0	mg/kg	4.00	4.00

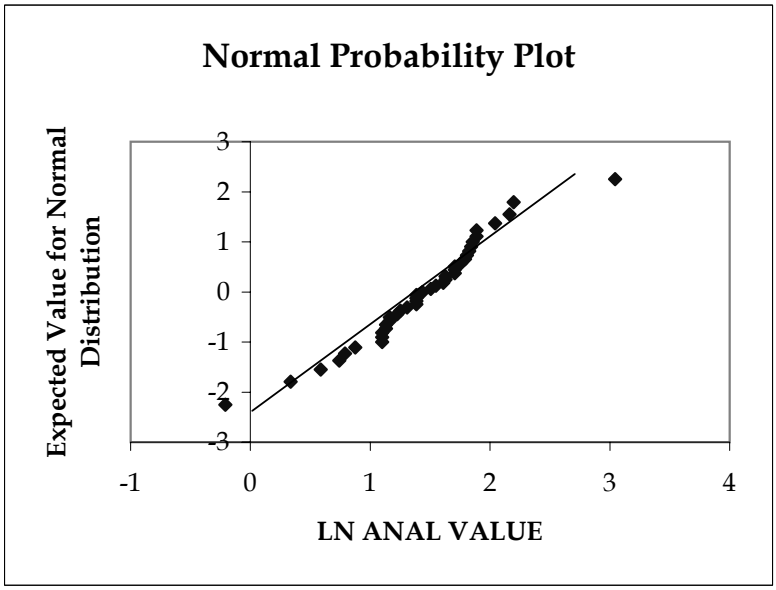
LN ANAL VALUE
0.88
1.16
1.31
1.22
1.39
1.55
1.50
1.44
1.13
0.59
-0.21
0.34
0.74
0.79
2.20
1.13
1.25
1.89
1.16
3.04
1.79
1.10
1.70
1.10
1.10
2.16
1.89
1.86
1.70
1.39
1.82
1.84
1.61
2.04
1.76
1.39
1.81
1.63
1.70
1.63
1.39

BINS	FREQ
1	1
2	2
4	17
6	11
8	7
10	2
15	0
20	0
>20	1

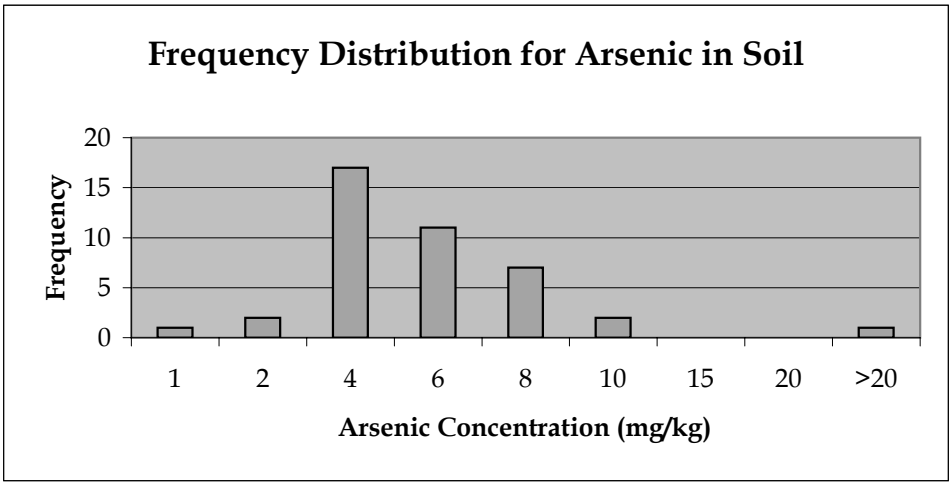
ANAL VAL	*Expected*
0.81	-2.250926
1.4	-1.791764
1.8	-1.546635
2.1	-1.369856
2.2	-1.227826
2.4	-1.107003
3	-1.000491
3	-0.904267
3	-0.815766
3.1	-0.733236
3.1	-0.655424
3.2	-0.581393
3.2	-0.510422
3.4	-0.441935
3.5	-0.375462
3.7	-0.310609
4	-0.247039
4	-0.184452
4	-0.122581
4	-0.061175
4.2	-1.39E-16
4.5	0.061175
4.7	0.122581
5	0.184452
5.1	0.247039
5.1	0.310609
5.5	0.375462
5.5	0.441935
5.5	0.510422
5.8	0.581393
6	0.655424
6.1	0.733236
6.2	0.815766
6.3	0.904267
6.4	1.000491
6.6	1.107003
6.6	1.227826
7.7	1.369856
8.7	1.546635
9	1.791764
21	2.250926

LN ANAL V	*Expected*
-0.210721	-2.250926
0.336472	-1.791764
0.587787	-1.546635
0.741937	-1.369856
0.788457	-1.227826
0.875469	-1.107003
1.098612	-1.000491
1.098612	-0.904267
1.098612	-0.815766
1.131402	-0.733236
1.131402	-0.655424
1.163151	-0.581393
1.163151	-0.510422
1.223775	-0.441935
1.252763	-0.375462
1.308333	-0.310609
1.386294	-0.247039
1.386294	-0.184452
1.386294	-0.122581
1.386294	-0.061175
1.435085	-1.39E-16
1.504077	0.061175
1.547562	0.122581
1.609438	0.184452
1.629241	0.247039
1.629241	0.310609
1.704748	0.375462
1.704748	0.441935
1.704748	0.510422
1.757858	0.581393
1.791759	0.655424
1.808289	0.733236
1.824549	0.815766
1.84055	0.904267
1.856298	1.000491
1.88707	1.107003
1.88707	1.227826
2.04122	1.369856
2.163323	1.546635
2.197225	1.791764
3.044523	2.250926


Normal Probability Plot
Expected Value for Normal Distribution
3
2
1
0
-1
-2
-3
0
5
10
15
20
25
ANAL VALUE


Normal Probability Plot
Expected Value for Normal Distribution
3
2
1
0
-1
-2
-3
-1
0
1
2
3
4
LN ANAL VALUE

ANAL VALUE	
Mean	4.888049
Standard Error	0.498316
Median	4.2
Mode	4
Standard Deviation	3.190777
Sample Variance	10.18106
CV	0.652771
Kurtosis	16.02464
Skewness	3.320813
Range	20.19
Minimum	0.81
Maximum	21
Sum	200.41
Count	41
Confidence Level(95.0%)	1.007133



Outliers (k)	Samples (n)	Mean (n-k-1)	StDev (n-k-1)	ANAL VALUE (k-1)	Rosner R Stat	Rosner p-value
1	41	4.888048649	3.190776587	21	5.049539089	0.000473251
2	40	4.485249996	1.902477145	9	2.373090267	0.098661259
3	39	4.369487286	1.778909683	8.7	2.434363365	0.087795831
4	38	4.255526543	1.652229071	0.81	2.085380793	0.11661306
5	37	4.348649025	1.57067132	7.7	2.133706093	0.105576366