FINAL

HEALTH RISK ASSESSMENT

FOR

INDUSTRIAL SERVICE OIL COMPANY, INC.

HAZARDOUS WASTE FACILITY APPLICATION

Prepared for:

California Environmental Protection Agency
Department of Toxic Substances Control
Region 3

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TABLE OF CONTENTS

HEALTH RISK ASSESSMENT FOR INDUSTRIAL SERVICES OIL COMPANY, INC.

Page No.

I. EXECUTIVE SUMMARY 1

II. INTRODUCTION 4

A. Purpose 4
B. Health Risk Assessment Methodology 4

III. FACILITY CHARACTERIZATION 5

A. Facility Location 5
B. Facility Description 5
C. Sources of Stack and Fugitive Emissions 11
D. Chemical of Potential Concern 11

IV. EMISSION ESTIMATES 13

A. Boilers/Heaters 13
B. Loading/Unloading Racks 13
C. Storage Tanks 14
D. Storage Drums 14
E. Valves/Flanges/Pump Seals 15
F. Wastewater Treatment System 14
G. Waste Solids Treatment Unit 16
H. Fuel Blending 16
I. Glycol Distillation Unit (Antifreeze) 16

V. EXPOSURE SCENARIO SELECTION 18

A. Exposure Pathways 18
B. Exposure Scenario Locations 18
C. Averaging Periods 19

TABLE OF CONTENTS
(Continued)

Page No.

VI. AIR DISPERSION AND DEPOSITING MODELING 20

A. ISC Control Options 20
B. ISC Source Options.....19
C. ISC Meteorological Data Options.....21
D. ISC Terrain Data 22
E. ISC Output Types 22

VII. ESTIMATION OF MEDIA CONCENTRATIONS.....23

A. Calculation of COPC Concentration in Air for Direct Inhalation 23
B. Calculation of COPC Concentration in Soil 23
C. Calculation of COPC Concentration in Produce 26
D. Quantifying Exposure 27
E. Intake from Soil 28
F. Intake from Produce.....28
G. Intake from Inhalation.....28

VIII. RISK AND HAZARD CHARACTERIZATION.....30

A. Quantitative Estimation of Cancer Risk 30
B. Quantitative Estimation of Non-Cancer Chronic Effects 32
C. Quantitative Estimation of Acute Effects 32
D. IRAP Results.....33

IX. UNCERTAINTY INTERPRETATION 34

A. Emission Estimates 34
B. Air Dispersion and Deposition Modeling.....34
C. Exposure Assessment.....34
D. Toxicity Data 36

XI. REFERENCES.....38

TABLE OF CONTENTS
(Continued)

Page No.

TABLES

Table ES-1: Executive Summary of Health Risk Assessment Results for the ISOCI Facility 2
Table 1: ISOCI Project Description Summary 39
Table 2: Facility Hazardous Waste Units Waste Codes....41
Table 3: Source Parameters....44
Table 4: Chemicals of Potential Concern Health Effects....45
Table 5: Agency Established Health Effects Thresholds....46
Table 6: Cancer Risk by Chemicals of Potential Concern for Reasonable Maximum Exposed Resident....47
Table 7: Cancer Risk by Pathway for Reasonable Maximum Exposed Resident....48
Table 8: Cancer Risk by Source for Reasonable Maximum Exposed Resident 49
Table 9: Cancer Risk by Chemicals of Potential Concern for Reasonable Maximum Exposed Worker....50
Table 10: Cancer Risk by Pathway for Reasonable Maximum Exposed Worker 51
Table 11: Cancer Risk by Source for Reasonable Maximum Exposed Worker....52
Table 12: Sensitive Receptor Locations and Calculated Cancer Risk 53
Table 13: Cancer Risk by Chemicals of Potential Concern for Sensitive Receptor 54
Table 14: Cancer Risk by Pathway for Sensitive Receptor 55
Table 15: Cancer Risk by Source for Sensitive Receptor....56
Table 16: Maximum Chronic Hazard Quotient by Chemicals of Potential Concern and Source....57
Table 17: Maximum Acute Hazard Quotient by Chemicals of Potential Concern and Source....58
Table 18: Sources of Uncertainty for the Health Risk Assessment 59

TABLE OF CONTENTS
(Continued)

FIGURES

Figure 1: Human Health Risk Assessment Process
Figure 2: Regional Location Map
Figure 3: Site Location Map
Figure 4: Land Use Map
Figure 5: Proposed Facility Plan
Figure 6: Maximum Impact Locations
Figure 7: Modeled Receptor Locations

APPENDICES

Appendix A Source Emission Rates
Appendix B Selected IRAP Results

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ACRONYMS

ABBREVIATIONS	DESCRIPTION
CalEPA	California Environmental Protection Agency
COPC	Chemicals of Potential Concern
DTSC	Department of Toxic Substances Control
EAI	Environmental Audit, Inc.
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
HEAST	Health Effects Assessment Summary Tables
HHRAP	Human Health Risk Assessment Protocol
HQ	Hazard Quotient
HRA	Health Risk Assessment
IRAP	IRAP-h View Model by Lakes Environmental
IRIS	Integrated Risk Information System
ISCST3	Industrial Source Complex – Short Term 3
NWS	National Weather Service
OEHHA	Office of the Environmental Health Hazard Assessment
OSWER	Office of Solid Waste and Emergency Response
PAHs	Polycyclic Aromatic Hydrocarbons
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RMER	Reasonable Maximum Exposed Resident
RMEW	Reasonable Maximum Exposed Worker
RMPS	Raw Material Preparation System
SCAQMD	South Coast Air Quality Management District
TAC	Toxic Air Contaminants
TSDF	Treatment, Storage and Disposal Facility

HEALTH RISK ASSESSMENT
FOR INDUSTRIAL SERVICES OIL COMPANY, INC.

I. EXECUTIVE SUMMARY

Industrial Service Oil Company, Inc. (ISOCI) is applying for a Treatment, Storage and Disposal Facility (TSDF) permit from the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC) to continue operations as a petroleum recycling and transfer facility. The facility is currently operating under a Resource Conservation and Recovery Act (RCRA) interim status permit, and is required by the DTSC to complete an environmental impact report as part of the Part B permit application process.

Environmental Audit, Inc. (EAI) is preparing an Environmental Impact Report (EIR) for the issuance of the RCRA Part B permit for the ISOCI facility, located at 1700 S. Soto Street, Los Angeles, California. As part of the EIR, a Health Risk Assessment (HRA) has been prepared to determine the air quality and related health impacts. This HRA has been prepared to comply with guidelines provided by DTSC and the U.S. Environmental Protection Agency (U.S. EPA). A HRA Protocol was prepared and submitted to the DTSC (EAI, 2004). This HRA has been prepared using the HRA Protocol and comments received on the Protocol from DTSC.

ISOCI is a petroleum recycling and transfer facility and occupies approximately 2.7 acres of land. The facility is located in a heavy industrial area and is surrounded by industrial land uses. The facility receives, stores and processes petroleum products such as used oil, oil/water mixtures and antifreeze. The facility also collects antifreeze for storage and transfer to other treatment facilities. There is no disposal of waste on site.

Emission sources at ISOCI which are addressed in this HRA include stack emissions from heaters, boilers and an emergency generator, and fugitive emissions associated with storage tanks, loading/unloading emissions and fugitive components e.g., (pumps, valves and flanges). Mobile sources (i.e. trucks and rail locomotives) are not included in this HRA.

The emissions from the ISOCI facility are based on the results of vapor space testing on storage tanks and emission factors from the U.S. EPA, and the South Coast Air Quality Management District (SCAQMD). All emission sources at the ISOCI facility were modeled to determine the ground level impacts of various contaminants. The U.S. EPA-approved Industrial Source Complex Short-Term model was used as the air dispersion and deposition model for the HRA. The major sources of contaminants from the ISOCI facility include volatile organic compounds from various fugitive sources.

The results of the HRA are summarized in Table ES-1. The results of the HRA indicate that the incremental cancer risk increase to the Reasonable Maximum Exposed Resident (RMER) is 1.16 x 10^{-6} or 1.2 in a million based on a 30-year exposure. The location of the RMER is approximately 0.25 miles northeast of the facility. Potential exposure to benzene accounts for 48.6 percent of the cancer risk. Source contribution analysis indicates that fugitive emissions from tanks 21 through 27 (Source OILTREAT) contribute approximately 46.4 percent to the RMER incremental cancer risk increase, followed by fugitive emissions from the solid waste drums (Source DRUMS)(31.6 percent).

TABLE ES-1

EXECUTIVE SUMMARY OF HEALTH RISK ASSESSMENT RESULTS FOR THE ISOCI FACILITY

CARCINOGENIC HEALTH RISKS	
Reasonable Maximum Exposed Adult Resident	1.16 x 10^{-6}
Reasonable Maximum Exposed Worker	5.78 x 10^{-6}
Maximum Exposed Sensitive Adult Receptor	1.04 x 10^{-6}
Maximum Exposed Sensitive Child Receptor	0.47 x 10^{-6}
NON-CARCINOGENIC HEALTH RISKS	
Chronic Hazard Quotient	0.188
Acute Hazard Quotient	0.011

The incremental cancer risk increase to the Reasonable Maximum Exposed Worker (RMEW) is 5.78 x 10^{-6} or 5.8 in a million based on a 25-year occupational exposure period. The location of the RMEW is adjacent to the north-central boundary of the facility in an adjacent industrial area. Potential exposure to benzene accounts for approximately 44.8 percent of the cancer risk. Source contribution analysis indicates that fugitive emissions from tanks 21 through 27 (Source OILTREAT) contribute approximately 43.8 percent to the RMEW incremental cancer risk increase, followed by fugitive emissions from the solid waste drums (Source DRUMS)(23.3 percent).

Cancer risk calculations also were performed for 11 sensitive receptors (e.g., schools, day care facilities, hospitals, and retirement homes) located in the vicinity of the ISOCI facility. The maximum incremental cancer risk was calculated to be 1.04 x 10^{-6} or 1.0 in a million for adult residents and 0.47 x 10^{-6} or 0.5 in a million for child residents at the Lou Costello Jr. Recreation Center. Potential exposure to benzene accounts for 48 percent of the cancer risk for both adult and child residents. Source contribution analysis for both adult and child resisdents indicate that fugitive emissions from tanks 21 through 27 (Source OILTREAT) contribute approximately 46 percent to the incremental cancer risk increase, followed by fugitive emissions from the solid waste drums (Source DRUMS)(29 percent).

The chronic hazard quotient was calculated to be 1.88×10^{-1} with formaldehyde contributing approximately 37.7 percent and ethylene dibromide contributing approximately 26.4 percent of the risk. Chronic health impacts associated with fugitive emissions from solid waste drums are 40 percent of the chronic hazard quotient.

The acute hazard quotient was calculated to be 1.06×10^{-2} with chloroform contributing 96 percent to the risk. Acute health impacts associated with fugitive emissions from solid waste drums are 84.4 percent of the acute hazard quotient.

The presence of uncertainty is inherent in the risk assessment process. Because of this uncertainty, this risk assessment used scientifically supported assumptions, whenever available, and worst case or conservative assumptions when little or no data were available. The results of the HRA must be reviewed and carefully interpreted, considering these data limitations. Risk estimates generated in this HRA should not be construed as the expected rates of disease, but are merely estimates of risk, based on current knowledge and a large number of assumptions.

II. INTRODUCTION

A. Purpose

This purpose of this document is to assess the potential impacts associated with the emissions of toxic air contaminants (TAC) from activities at the ISOCI facility.

The HRA generally provides conservative estimates of the probability of contracting an adverse health effect. A "conservative" estimate is one that assumes worst case conditions to produce the largest potential impact on health effects. An adverse health effect is a reaction which can range from minor eye and throat irritations, shortness of breath, and headaches to serious conditions such as cancer, birth defects, and damage to human organs.

The estimate of health risk is dependent upon several factors, including but not limited to, the amount of contaminant introduced into the atmosphere, the toxicity of the contaminant, the distance between the emission source and the exposed individuals, weather conditions, and exposure pathways (routes the contaminant can enter the body, e.g., inhalation and ingestion).

The health risk estimate is expressed as a probability ratio, such as 1 in a million (i.e., 1/1,000,000, 0.000001, or 1×10^{-6}). The interpretation of the ratio is that for one million individuals exposed, one individual would be expected to have an adverse health effect.

B. Health Risk Assessment Methodology

The HRA can be outlined as an eight-step process (see Figure 1) including facility characterization, exposure scenario selection, air dispersion and deposition modeling, estimation of media concentrations, quantifying exposure, risk and hazard characterization, uncertainty interpretation, and risk evaluation.

In July 1998, U.S. EPA Office of Solid Waste and Emergency Response (OSWER) published the Human Health Risk Assessment Protocol (HHRAP). The HHRAP was developed to provide national guidance and consolidate information previously prepared by the U.S. EPA in other risk assessment guidance and methodology documents. The HHRAP and the DTSC guidance were reviewed and found to be based on the same fundamental risk calculations, exposure factors (e.g., frequency, duration, body weight, daily intake rate), and exposure pathways and provide the basis for this HRA.

A HRA Protocol was prepared and submitted to the DTSC (EAI, 2004). This HRA has been prepared using the methodology and assumptions outlined in the HRA Protocol and comments received on the Protocol from DTSC.

III. FACILITY CHARACTERIZATION

A. Facility Location

The ISOCI facility is located at 1700 South Soto Street in the City of Los Angeles, County of Los Angeles (see Figures 2 and 3). The facility is located in an area zoned by the City of Los Angeles for heavy industry (HI). The immediately adjacent areas are principally zoned heavy industrial. The City of Vernon is located about 0.5 mile to the south of the facility and the entire City of Vernon is zoned for industrial uses. The City of Los Angeles surrounds the facility to the north, east and west, which includes residential, commercial, and some industrial land uses. The railroad tracks located adjacent to the northern facility boundary are used by Union Pacific Railroad and Metrolink trains. Virtually all of the area surrounding ISOCI is zoned for heavy industry with a few commercial areas interspersed with the heavy industry. The closest residences are located approximately one-quarter mile north of the facility, on the north side of Olympic Boulevard (see Figure 4).

B. Facility Description

Existing Facility Operations

The existing facility operations are those that have been approved under the Part A applications submitted to DTSC in 1986 and as amended and approved by DTSC in 1988. Therefore, the facility operations that will be used for the "baseline" or to describe the environmental setting are those activities that have been allowed under the Interim Status Document (generally the 1988 Part A application). The Part A permit application did not provide specific site information, e.g., an accurate site plan. Therefore, ISOCI and the DTSC came to an agreement on what was included in the Part A application (see Table 1).

The major categories of waste streams processed at the ISOCI include waste oil (also referred to as used oil), oil/water mixtures (also referred to as oily water), oil sludges, and antifreeze. The California waste codes accepted by the facility include 221 (waste oil), 222 (oil/water separation sludge), 223 (unspecified oil containing wastes), 134 and 135. These are the only wastes currently accepted by the facility.

A wide variety of off-site hazardous waste generators bring wastes to the ISOCI facility via truck and railcars. Under existing operations, ISOCI receives about 45 trucks per day and about five railcars per week of hazardous waste.

Used Oil Treatment System: ISOCI's used oil treatment system consists of a series of strainers, storage tanks, and treatment tanks which use heat and chemicals to produce “recycled oil”. Used oil is transferred from trucks, railcars, or containers through strainers or grinder pumps to reduce the solids concentration. The used oil is pumped into storage tanks that feed the treatment tanks. Treatment chemicals and heat are added to the treatment tanks separating and removing water and contaminants from the used oil. Treatment chemicals (or virgin products) are used for emulsion breaking and pH adjustment. The chemicals are polymers of various commercial brands, sulfuric acid and sodium hydroxide. These chemicals are stored in drums, totes, or tanks in which they are

delivered from the producer. The water, oily sludge (contaminants), and oil phases are allowed to settle and separate in the tank. The water and oily sludge are pumped out separately and containerized for temporary storage and subsequent off-site disposal. The recycled oil product is pumped out into storage tanks for analytical certification. The used oil is considered to be "recycled" oil once it meets the recycled oil criteria specified in the California Health & Safety Code (H&SC) section 25250.1. Recycled oil can be sold for fuel, cutter stock, or refinery feed stock. The existing used oil treatment system is located within Containment Unit #4 on the east side, adjacent to Containment Unit #3. All recycled oil product as well as used oil awaiting recycled oil certification are stored in tanks in Containment Unit # 3 (see Figure 5).

Container Transfer Unit: A portion of the ISOCI facility was designated for use as a hazardous waste transfer station. The Container Transfer Unit could handle about 200 55-gallon containers or any combination of large and small containers ranging in size from 55-gallons to 5-gallons, which may total 11,000 gallons maximum. The transfer station was once used for receiving manifested hazardous waste in drums or other containers for temporary storage (no more than 144 hours) before being shipped off-site to a permitted treatment and/or disposal facility. This area has been acquired by ACTA and the container transfer unit is no longer in operation (see Figure 5).

Container Storage Unit: A portion of the ISOCI facility is used for waste and reagent container storage. The authorized container storage capacity is 100,000 gallons (or approximately 1,818 55-gallon containers). Containers may be stored in this area for up to one year.

Transfer Activities: "Transfer" means the loading, unloading, pumping, or packaging of hazardous waste. This includes unloading from and loading to railcars from tank trucks. Hazardous wastes manifested to the ISOCI facility may be transferred from tank trucks to railcars at the facility. The hazardous wastes transferred are authorized for acceptance by ISOCI under the company's Interim Status Document. The railcars containing the hazardous wastes are not stored at the facility for longer than ten (10) days.

There are two railspurs with secondary containment, located on the far east side of the facility (see Figure 5). Currently, one railspur (125,000-gallons) is authorized to handle hazardous waste activities. In addition, recycled oil product treated at the facility is transferred from tanks and tank trucks to railcars for shipment off-site. Each railspur can hold 5 railcars each with a 25,000-gallon capacity with a maximum total capacity of 250,000-gallons.

Tank Storage: The ISOCI facility has an authorized tank storage capacity of 350,000 gallons for the storage of used oil. Most of these tanks are incorporated in the used oil treatment system.

Antifreeze: ISOCI is currently authorized to consolidate antifreeze in a tank with a maximum capacity of 6,143-gallons for storage up to one year. The antifreeze wastes are subsequently transferred to an off-site permitted recycling facility. The antifreeze waste storage tank is located in Containment Unit #4 (see Figure 5).

Secondary Containment: Secondary containment is provided for process and storage tanks using an above ground reinforced concrete structure designed to contain spills from the tanks located within the unit. All tanks are located in tank Containment Units #3 and #4. Containment Unit #4 is

generally used for treatment activities and Containment Unit #3 is generally used for used oil storage. The secondary containment system for the ISOCI tank storage area has been designed and constructed to surround the tanks and to prevent any contact between underlying or surrounding soils and the contents of the secondary containment area in the event that wastes are released from the tanks. The containment units are constructed with a 12-inch thick concrete foundation with reinforced steel and the surface of the structure is coated with epoxy to render it impermeable. The walls are reinforced eight-inch thick concrete masonry. The impervious sealed concrete secondary containment structure surrounding the tank storage area is designed to contain precipitation from a 24-hour, 25-year storm, plus 10 percent of the total volume of all tanks or 100 percent of the capacity of the largest tank within the tank storage area, whichever is greater. Internal dividing walls are provided within the containment structure as required by Los Angeles fire codes.

The secondary containment system is also designed to prevent run-on or infiltration of precipitation from outside the tank storage area. Sumps are provided to collect spills or rain water. Tanks have additionally been bolted down to resist earthquake forces. The tank storage areas are equipped with secondary containment as required by 22 CCR 66264.193. A Registered Civil Engineer has certified that secondary containment at the ISOCI facility meets the requirements of 22 CCR 66264.193.

After secondary containment units were constructed at the ISOCI facility, tanks were relocated within the containment units.

Proposed Facility Operations

Additional Tank Capacity: The ISOCI facility proposes to change the tank capacity from 795,653 gallons to 1,067,760 gallons total (Table 1). This will increase total permitted tank capacity by 272,107 gallons. Both Containment Units #3 and #4 will hold the additional tank capacity. The additional tank storage capacity is due in part to the proposed addition of other treatment processes at the ISOCI facility.

Container Storage Capacity: ISOCI proposes to use the area located in the northwest portion of the site for container storage (Referred to as Container Management Area No. 1 and No. 7 in Figure 5). Container Management Area No. 1 will have a maximum storage capacity of 200 55-gallon containers or about 11,000 gallons. Issuance of the Part B permit will allow this area to be used for the transfer and storage of RCRA waste streams that can be stored for a maximum of one year. Waste can also be consolidated in roll-off bins. Ignitable or reactive waste will not be stored in this area. Secondary containment will be provided for this storage area. Other activities in this area include inspection, sorting, sampling, labeling, and preparing of containers for transport.

Container Management Area No. 7 will have a maximum storage capacity of 640 55-gallon containers or about 35,200 gallons. Issuance of the Part B permit will allow this storage area to be used for the transfer and storage of RCRA waste streams that can be stored for a maximum of one year. Ignitable and reactive wastes may be stored in Container Management Area No. 7 under the condition that these wastes are stored greater than 50 feet from the property lines. Secondary containment will be provided for this storage area. Other activities in this area include the loading

and unloading of containers from trucks, inspection, sorting, sampling, storing, emptying, shipping and consolidating waste in containers; and labeling and preparing containers for transport.

The hazardous waste that can be stored in each area of the facility is identified in Table 2.

Railcars: ISOCI proposes to operate the two existing rail spurs as a hazardous waste container storage and transfer unit (see Figure 5). A 58,748-gallon tank will remain empty for railcar spill containment only. Railcar loading and unloading operations include: off-loading of oil, waste waters, and antifreeze for treatment at ISOCI into tanks or tank trucks; loading of Non-RCRA hazardous liquid wastes from tank trucks to railcars; loading and off-loading of containers of waste, using forklifts, for treatment, storage, and transfer at ISOCI; loading of RCRA and Non-RCRA hazardous waste from any tank in the ISOCI facility into a railcar. Ignitable RCRA waste is prohibited from being stored on the rail spur for any period. Hazardous waste may be stored in 10 25,000-gallon railcars at ISOCI prior to disposal for a maximum of one year by regulation. ISOCI estimates that about 35 railcars per week will arrive/depart from the facility. Hazardous waste from an estimated 30 trucks per day will be directly loaded into railcars. The purpose of the transfer and railcar storage activity is to facilitate rail and truck transport of RCRA and California regulated hazardous wastes to appropriate treatment, storage and disposal facilities.

Wastewater Treatment System: ISOCI proposes to treat hazardous wastewater contaminated with oil, organic compounds and metals in the wastewater treatment system. The wastewater treatment system is located in Secondary Containment Unit #4 (see Figure 5). The wastewater treatment system consists of several above ground enclosed tanks that will be used for: equalization (EQ), oil/water separation (OWS), coagulation/flocculation (CFT), dissolved air flotation (DAF), advanced oxidation processing (AOP), solids management (SM), and storage.

Raw wastewater is first accumulated in storage tanks, where it will be held until it is ready to be processed through the OWS, the CFT, and/or the DAF. Variable drive feed pumps will equalize the flow to prevent the overfilling of tanks. Levels in the storage tanks and the feed pumps will be monitored to prevent overflow.

After equalization, wastewater will be pumped to the OWS, which will separate free and demulsified oil. Recovered oil will be collected in a 55-gallon collection drum. Sludge bottoms will be discharged by gravity into a sludge collection tank. From the OWS, wastewater will flow onto the three-chamber CFT. Treatment chemicals will be added to control pH and enhance coagulation/flocculation, and sensors will monitor pH and liquid levels. Bottom sediments from the CFT will be collected in the effluent holding tank.

Wastewater from the CFT will gravity feed to the DAF. The DAF will separate floating material and sediment that will be gravity fed to a sludge collection tank and will further treat the residue in the sludge conditioning tank and filter press. Wastewater from the DAF is then gravity fed to an effluent holding tank. The effluent holding tank will serve as the distribution point for wastewater to flow either to the AOP tanks, or the vacuum compression feed tank. The effluent holding tank will receive filtrate from solids dewatering and water draining from the DAF. The DAF will include three level switches to control effluent pumps when operated in the automatic mode. Each effluent pump will be equipped with variable frequency drives for controlling the flow rate to the

AOP and vacuum compression feed. When a high-high condition is reached in the effluent holding tank, the DAF feed pumps will be shut off automatically.

The AOP will operate in batch mode, while the contents of the oxidation contact tanks are recirculated through the "Clorin" and e-OX systems. Oxidizing gases will be drawn into the recirculating water stream through a series of jet mixers in the recycle contact tank pumps. Each pump, when operating in automatic mode, will be controlled by level switches in the oxidation contact tanks. These pumps will recirculate water from the oxidation contact tanks through the "Clorin" and e-OX generators, thereby providing transferring oxidizing gases into the liquid stream through jet mixers. The "Clorin" generators, which are served by a common brine tank, will be controlled by an in-line residual chlorine monitor, which will stop "Clorin" generation at an established chlorine concentration. A level switch in the brine tank will actuate a solenoid valve for control of feed (city) water. Pressure sensors in the "Clorin" generator discharge piping will automatically turn off each generator upon reaching a pressure set point. When the pressure set point is reached, the AOP will stop and wastewater treated in the oxidation contact tanks will be tested before batch discharge in accordance with the City of Los Angeles wastewater discharge permit.

OWS bottom solids, DAF float, and DAF bottom solids will be collected in a 500-gallon sludge collection tank, which will be equipped with an inductive type level switch. At high level, sludge will be automatically transferred to a 2,000-gallon sludge conditioning tank that will be equipped with a mixer. A float switch will automatically turn off the solids transfer pump at high level. Sludge may be conditioned with diatomaceous earth or similar material prepared in the pre-coat preparation tank. Pre-coat slurry will be prepared and recirculated through the filter press to deposit a porous protective "pre-coat" layer on the filter cloth. Conditioned sludge will be pumped through the recessed chamber filter press for dewatering. Dewatered sludge cake will be discharged to a self-tipping dumpster cart for subsequent disposal. The WWTS will be equipped with a comprehensive safety shut down system. Shut down will occur in the event of low and high levels in the storage and treatment tanks, low flow in pumps, or high pressures in the "Clorin" generators.

Wastewater shall be treated to meet sewer discharge standards before batch discharge into the sewer system.

This system will process about 84,600 gallons/day and the associated tank storage capacity is 228,040 gallons.

Sewer Discharge Line: With the addition of the wastewater treatment system, a sewer discharge line will be constructed and operated by the ISOCI facility. The sewer discharge line will only be connected to designated sewer discharge tanks. Pre-treated wastewater will be discharged to the public sewer system via the constructed sewer discharge line.

Oil Treatment System: ISOCI will continue to use the existing heat and chemically enhanced used oil treatment system and plans to expand the number of tanks in the oil treatment system. Alternatively, the tanks may be heated by direct steam injection. Wastewater that was previously disposed of off-site will now be sent to the wastewater treatment system and treated prior to sewer

discharge. Water that cannot be adequately treated to meet sewer discharge specifications onsite at the ISOCI facility will be treated as hazardous waste and shipped off-site for disposal.

The solids pumped to the filter press are collected as filter cake while the filtrate is returned to the circulation tank. When the filter press is full, the contents are emptied, by gravity, into a bin and the filter cloths are cleaned and inspected. The solids are subsequently shipped off-site for disposal.

The new oil treatment system will have a capacity of 84,600 gallons per day which, combined with the existing oil treatment system, will result in a total oil treatment capacity of 228,600 gallons per day. The maximum tank storage capacity is 628,612 gallons.

Fuel Blending Unit: ISOCI proposes to blend hazardous waste (BTU value greater than 5000) at the facility in the RCRA fuel blending system. The fuel-blending tank will be located in Secondary Containment Unit #3 (see Figure 5), centrally located in the ISOCI facility. Organic liquids will be received in two 20,150-gallon tanks and then blended in one 71, 025-gallon tank. The large tank will be agitated to ensure complete mixing of the liquid. The blended fuel will be sent off-site for energy recovery as fuel for cement kilns, incineration facilities or other energy recovery facilities. Treatment and disposal facilities specify the desired parameters for blended waste fuels used for energy recovery. By blending greater than 5,000 BTU organic waste streams together, the composite hazardous waste liquid can be designed to meet the required parameters for receipt and disposal at an off-site facility.

The fuel blending system has a process capacity of 25,000 gallons per day with a maximum tank storage capacity of 111,325 gallons. The fuel blending storage tank (tank 600) was modelled with vapor control using 95 percent control effieciency.

Waste Solids Treatment Unit: The waste solids treatment unit is located in the eastern portion of Container Management Area No. 1 (see Figure 5). The purpose of this treatment unit is to eliminate free liquids from the waste so that it can shipped off for land disposal. The waste solids treatment unit consists of a sludge thickening tank, centrifuge, and cement mixer. The waste is collected in a 10,000-gallon sludge thickener tank. The tank is designed to dewater sludges by gravity settling. Sludge is drawn from the bottom of the tank and pumped to the centrifuge. The centrifuge further separates and concentrates the solids from the liquids. Solids build up on the inside of a rotating bowl as the liquids pass through holes. The liquid collects inside the centrifuge tank and is eventually pumped to the circulation tank in the oil treatment system. The waste solids are collected and transferred to the stabilization unit.

The stabilization unit is a conventional 6 cubic yard mixer. Waste solids, stabilizing materials and/or reagents are all mixed in the unit for a predetermined time. The stabilizing agents and reagents aid in the solidification of the waste mixture. After thorough mixing, the stabilized material is transferred from the stabilization unit into a container for off-site disposal. Wastes generated from this process are analyzed to determine chemical and physical characteristics.

The capacity of this unit is 14,400 gallons per day. The tank storage capacity is 10,000 gallons.

Glycol Recovery System: The glycol recovery system (GRS) is located in Secondary Containment Unit #4 (see Figure 5). The GRS will treat antifreeze and other waste glycols from off-site sources and on-site treatment of used oil and oily wastewater. Glycol will be recovered through two distinct processes: vapor compression and glycol distillation.

Antifreeze and other waste glycols will be treated in tanks by the addition of reagents to enhance the separation of oil, water, and glycol. Some antifreeze requiring special processing may be pretreated in the wastewater treatment system. After separation the glycol will be fed to a heat exchanger that leads to a vapor compression tower. The liquid phase will then flow continuously through an auxiliary heat exchanger. The heat exchanger will separate the liquid into a product stream (consisting of glycol and wastewater) and a vapor stream. The vapor stream, consisting mainly of water, will be condensed in a vapor compressor. Once condensed, the vapor will be used for reflux and then sent to the wastewater treatment system for further processing before being discharged to the sewer. The product stream will be sent to the glycol distillation tower for processing.

The glycol distillation tower will separate the product stream into three components: (1) A water-rich distillate, which will be condensed and used for reflux before being sent to the wastewater treatment system, (2) an intermediate cut of glycol product, which will be sent to glycol side stripper and reboiler, and (3) a viscous heavy bottom that will be sent to the wastewater treatment system prior to sewer discharge. The intermediate cut of glycol product will be heated and then tested to meet glycol product specifications. That which does not meet product specifications will be sent for further processing.

The capacity of this unit is 86,400 gallons per day. The tank storage capacity is 28,035 gallons.

C. Sources of Stack and Fugitive Emissions

Review of the facility identified six point sources (stacks), and 42 area sources (fugitive emission sources such as tanks, valves, flanges, etc.). The point sources include two boilers, three heaters and one backup generator. Fugitive sources are divided into 17 fugitive sources. The source parameters are presented in Table 3.

D. Chemicals of Potential Concern

The Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency (CalEPA) publishes a list of chemicals known to produce adverse health impacts. Adverse health impacts can range from causing cancer to minor irritation of the eyes during exposure. Chemicals on the OEHHA list are classified into three groups: carcinogens, chronic health impacts, and acute health impacts. In addition, the U.S. EPA Integrated Risk Information System (IRIS) database and the U.S. EPA Health Effects Assessment Summary Tables (HEAST) are compilations of human health risk and toxicity information. HHRAP presents information for 204 chemicals from the IRIS and HEAST databases. The OEHHA and HHRAP lists were reviewed to identify chemicals of potential concern (COPCs).

A total of 39 chemicals were identified from the lists and found to be present at the ISOCI facility. The health effects attributed to each chemical are presented in Table 4.

IV. EMISSION ESTIMATES

Emission estimates are based on engineering estimates, equipment descriptions contained in the ISOCI Hazardous Waste Facility Permit Application, RCRA Parts A and B, Part B Application), source tests performed on various tanks at the facility, and emission factors available from U.S. EPA and SCAQMD.

The following references were used in preparing the emission estimates of the sources at the ISOCI facility:

- Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) Air Emission Models, Documentation (U.S. EPA-450/3-87/026), (U.S. EPA 1987).
- U.S. EPA Compilation of Air Pollutant Emission Factors (AP-42).
- Estimating Air Toxics Emission from Organic Liquid Storage Tanks (U.S. EPA 450/4-88-004) October 1988.

The emission estimates were prepared based on the HRA Protocol submitted to the DTSC (EAI, 2004).

A. Boilers/Heater

The facility proposes to operate two boilers, two heaters, and an oil heater to provide steam for the treatment process. The equipment will be fired by natural gas and may operate up to 24 hours per day (hr/day). The potential toxic emissions from natural gas combustion include benzene, formaldehyde, and toluene. The emissions for the boilers and heater were calculated as follows:

$$E = V \times OT \times EF$$

Where:

V = Volume of natural gas used (SCF/Hr)
OT = Operating time (Hours/year)
EF = Emission Factor (lb VOC/10^6 ft^3 natural gas)

The emission factor used for each compound, including COPCs, were taken from the SCAQMD default emission factors.

B. Loading/Unloading Racks

The facility has four loading/unloading stations for trucks and ten for rail car bulk liquid loading operations. There are two additional truck loading/unloading positions used primarily for unloading purposes. The estimate of emissions from the loading operation were calculated using the method in the Hazardous Waste TSDF Air Emission Models Documentation (USEPA 1987). The emissions for the loading/unloading racks were calculated as follows:

$L_L = (12.46 \times S \times M \times [P/(P_a-P)])/T$

Where:

L_L = Loading Loss (lbs/1,000 gal)
S = Saturation Factor (dimensionless)
M = Molecular weight of vapor (lb/lb-mole)
P = True vapor pressure of liquid loaded
P_a = Average atmospheric pressure at tank location (psia)
T = Temperature of bulk liquid loaded ($^oR = {}^oF + 460$)

The speciation of toxic air contaminants were based on data collected from the sampling of the headspace in the storage tanks. Mobile sources (i.e. truck and rail locomotives) are not included.

C. Storage Tanks

The emission estimates for storage tanks were developed using emission factors developed by the SCAQMD, CARB, and/or the U.S. EPA. Emission estimates for storage tanks containing volatile organic materials were based on the fugitive emission calculations for fixed roof storage tanks developed by U.S. EPA's Compilation of Air Pollutant Emission Factors (AP-42) and included in the TANKS Model. These emission calculations are considered appropriate for the ISOCI facility and are the only equations approved for calculating storage tank emissions by U.S. EPA, CARB, and the SCAQMD. The calculations were completed using the SCAQMD Excel spreadsheet emission model.

D. Storage Drums

The only potential air emissions from the storage drums are associated with VOCs which can volatilize, form an air plume, and migrate off-site. There is no other mechanism by which other compounds (non-VOC, particulates, etc.) stored in drums can become airborne and be released to the surrounding environment during routine facility operations. Therefore, the chemicals of concern are limited to those compounds which are considered to be VOC's.

The 55-gallon drums are designed to be stored with a sealed lid and bung so that the potential for breathing loss is minimal and assumed to be negligible (U.S. EPA, 1987). The U.S. EPA studied the emissions from waste treatment, storage and disposal facilities and concluded that, while emissions from 55-gallon drums were limited, minor emissions could occur. The U.S EPA developed an emission fraction for drums containing volatile organic compounds (VOCs) of 10^{-4} i.e., if 10,000 pounds of drummed waste were moved, 1 pound is assumed to be lost (U.S EPA, 1987). This emission factor calculates to be about 11 grams per drum. Therefore, the total VOC emissions were calculated using a U.S. EPA derived emission factor (U.S EPA, 1987) for each VOC or flammable waste handled.

$E = 10^{-4} \times I \times Wi \times V_i$

Where:

E = Emission from drum, Mg/yr
I = Throughput, Mg/yr
W_i = VOC Weight fraction
V_i = Volatilization fraction

The facility will handle a wide variety of materials by drum including solvents and other volatile organic materials which have previously not been handled at the facility. The volatile organic compounds calculated from the drums were speciated by weighting the emissions by vapor pressure and health hazard criteria (e.g., carcinogenic unit risk factor) rather than assuming that the emissions are equally distributed. This places greater weight and results in higher emissions of the compounds that are most volatile and most hazardous to health, e.g., benzene, acetaldehyde, acrylonitrile, carbon tetrachloride, chloroform, cyclohexanone, methanol, methylene chloride, methyl chloroform, and vinyl chloride.

E. Valves/Flanges/Pump Seals

The method used to calculate the valve, flange and pump emissions from the facility was obtained from the Hazardous Waste TSDF Air Emission Models, Documentation (U.S. EPA 1987). The emissions from the valves, flanges, and pump seals were based on the SCAQMD uncontrolled emission factors for components in light and heavy liquid service. The only material handled in the treatment system are recycled petroleum oil products so this would meet the definition of a "heavy" liquid (i.e., has a vapor pressure less than 0.1 psia). Any pumps identified as RCRA transfer pumps were classified as light liquid service pumps. The corresponding fugitive components (i.e., valves and flanges) were also considered to be in light liquid service.

T_L = The sum of (C x EF) for all components

Where:

T_L = Total loss (lbs/day)
C = Number of each component
EF = Emission factor for each component below. These emission factors are based on the EPA AP-42, modified for the emission control requirements of the SCAQMD.

F. Wastewater Treatment System

The source of emissions for the wastewater treatment system is assumed to be from vent pipes on the water treatment unit. The estimated capacity of the water treatment system is 84,600 gallons per day. The emissions from the ISOCI water treatment system were estimated using an emission factor from AP-42, Table 5.1-2, controlled emissions from oil/water separators (U.S. EPA 1995). The emissions from the water treatment system will be calculated as follows:

$T_L = V \times OT \times EF$

Where:

T_L = Total loss (lbs/year)
V = Volume of wastewater treated each day (gallons/day)
OT = operating days per year (days/year)
EF = Emission Factor (0.2 lb VOC/1000 gal)

G. Waste Solids Treatment Unit

ISOCI proposes to treat the solids which are generated at its facility as a result of the various waste treatment processes designed to remove water from the waste. These solids will be stabilized by the addition of commercial chemicals prior to disposal off-site. The following equipment will be utilized as part of the solids treatment unit: plate and frame filter press; and stabilization mixer. Solids are generated at the facility in screening filters and in storage and treatment tanks where they settle to the bottom of the tanks. Wastewater/oily solids (tank bottoms) will be pumped from the storage and treatment tanks through a plate and frame filter press which retains the solids and passes the remaining liquid back to a tank. Distillation bottoms resulting from the distillation of waste solvents or glycols also may be processed through the solids treatment unit. Proprietary chemicals and stabilization solids (e.g., kiln dust or cement) may be added to facilitate waste management and meet disposal criteria at various off-site disposal facilities.

The vapor composition of the storage tanks for this waste stream were used to determine the vapor composition of the centrifuge emissions.

H. Fuel Blending

ISOCI proposes to blend fuels at the facility. Tank number 600 will be used for fuel blending. The blended fuel will be sent off-site for energy recovery as fuel for cement kilns. Treatment and disposal facilities specify the desired parameters for blended waste fuels used for energy recovery. Waste fuels will be screened for the desired parameters and placed into the blending tank with other waste fuels of a similar nature. Incompatible materials or fuel not meeting the desired specifications will not be mixed or blended. The resulting blended waste fuel will be shipped off-site via rail car or truck to selected cements kilns.

The emissions from the fuel blending tank are the same as the emission calculations described for fixed roof storage tanks.

I. Glycol Distillation Unit (Antifreeze)

ISOCI proposes to consolidate and process waste antifreeze by distillation/filtration through the antifreeze filtration unit and the ethylene glycol distillation unit. The process involves purification of glycol by filtration and/or distillation of glycol by heating antifreeze solution in a distillation column at a selected temperature until the glycol boils into vapor. The vapor is collected and

condensed into pure liquid form and stored in a tank or container. The glycol can be used to blend new antifreeze with the addition of water, color and corrosion inhibitors.

The emissions from the glycol distillation unit include boiler emissions and emissions from various components (pumps, valves, and flanges). The emission estimates for these sources are provided above.

V. EXPOSURE SCENARIO SELECTION

Exposure scenarios are defined to adequately assess the potential impact of the facility on the surrounding area. An exposure scenario is a combination of exposure pathways to which a single receptor may be subjected.

The HHRAP identifies seven recommended exposure scenarios that should be considered for inclusion in the HRA. The seven scenarios are (1) subsistence farmer, (2) subsistence child, (3) adult resident, (4) child resident, (5) subsistence fisher, (6) subsistence fisher child, and (7) acute risk.

The ISOCI facility is located in urban Los Angeles County in the Los Angeles. The immediate vicinity of the facility is industrial. The closest residential area is located about 0.25 mile northeast miles of the facility.

The three relevant scenarios for the area surrounding the ISOCI facility are adult resident, child resident, and acute risk. Subsistence farming and fishing do not occur in the vicinity of the facility. The Los Angeles River is channelized, and not designated as having commercial/recreational fishing beneficial use in the area (CRWQCB-LAR, 1994.)

A. Exposure Pathways

Exposure pathways occur directly – via inhalation and indirectly – via subsequent ingestion of water, soil, vegetation, or animals contaminated by the COPCs. The HHRAP recommends exposure pathways associated with the adult and child resident scenarios to be inhalation of vapors and particulates, incidental ingestion of soil, ingestion of drinking water from surface water sources, and ingestion of homegrown produce. Infant exposure to dioxins and furans via the ingestion of mother's milk is evaluated separately. For the acute risk scenario, the only pathway considered is the inhalation of vapors and particulates. The HHRAP does not recommend including the dermal exposure to soil pathway based on available data, which indicate the contribution of dermal exposure to soil to the overall risk is typically small. As such, the dermal exposure pathway is not included in this HRA.

The ISOCI facility does not generate particulate toxic emissions and is not near a surface water drinking source. Therefore, only inhalation of vapors, incidental ingestion of soil, and ingestion of home grown produce are valid exposure pathways. The ISOCI facility does not emit dioxins or furans; therefore, the mother's milk exposure pathway is not considered a valid pathway.

B. Exposure Scenario Locations

The current and reasonable potential future land use surrounding the facility is considered when evaluating potential risk. The locations associated with the exposure scenarios include occupational, residential, and sensitive receptors. Sensitive receptors include schools, day-care centers, nursing homes/retirement homes, hospitals, and community centers. Fourteen sensitive receptors, including three specific residential locations are included in this HRA. Receptor grids (a total of 410 receptor locations) are used for the air dispersion and deposition modeling around the

facility. For hazard characterization, the two maximum receptor locations from within the receptor grid, eleven sensitive receptors, and three residential receptors are included.

Receptor locations incorporated into the dispersion model included the following grids:

- Fenceline grid (spaced every 100 meters) around the perimeter of the facility;
- Refined Grid (50 meters x 50 meters spacing) centered about each maximum exposure point (i.e., cancer and chronic).
- Intermediate Grid (500 meters x 500 meters spacing) extending 2.5 kilometers in all directions relative to the facility.
- Coarse Grid (1 km x 1 km spacing) extending 5 kilometers in all directions relative to the facility.

In addition to the above, sensitive populations were also modeled. Sensitive populations were identified by field reconnaissance within about a one mile radius of the facility. Reconnaissance included a search for sensitive populations such as schools, rest homes/retirement homes, hospitals, day-care centers, etc. A total of 11 sensitive populations were modeled.

C. Averaging Periods

The HRA used an annual average ground level concentration to estimate potential carcinogenic and chronic health risks. One-hour ground level concentrations were used to determine the potential for acute health risks.

VI. AIR DISPERSION AND DEPOSITION MODELING

Air dispersion and deposition modeling is used to determine the potential for exposure to the population surrounding the facility. Exposure assessment incorporates the results of dispersion and deposition modeling with health effects known to be associated with COPCs and potential exposure pathways to produce an estimated health risk. The selection of the model and the parameters used are presented below.

The most appropriate model available for air dispersion and deposition from an industrial site like ISOCI, is the U.S. EPA Industrial Source Complex – Short Term 3 (ISCST3) model (Version 00101). ISCST3 incorporates meteorological data, site-specific data, emissions characteristics, and terrain data to calculate potential impact at defined receptor locations. U.S. EPA has established default controls based on the Guidelines on Air Quality Models (Title 40, Code of Federal Regulations, Part 51, Appendix W). The SCAQMD has made additional recommendations regarding the default control settings. Based on these recommendations, the following control options were used in the ISCST3 model.

A. ISC Control Options

- Use final plume rise,
- Use stack tip downwash,
- Use buoyancy-induced dispersion,
- Do not use missing data processing routine,
- Do not use calms processing routine,
- Use air toxics option,
- Use upper-bound concentration estimates for sources influenced by building downwash,
- Use default vertical potential temperature gradients,
- Use default wind speed profile exponents, and
- Use urban dispersion coefficient.

B. ISC Source Options

Forty-three sources have been identified at the ISOCI facility consisting of six point sources, and 37 area sources. Equipment with a discrete emission stack is modeled as a point source. The fugitive emissions from the facility have been divided into 15 area sources to conform to the ISCST3-recommended aspect ratio. All sources are modeled using a unitized emission rate of 1 gram per second (g/s). ISCST3 does not provide for multiple pollutants emitted simultaneously. Therefore, by using a unitized emission rate, one ISCST3 modeling can be post-processed for all COPCs. To conform to the HHRAP and allow the health risk model to be used, the vapor, particle, and particle-bound phases of the source emissions are included in the ISCST3 input file. The particle and particle-bound phases were essentially set to zero by using very small scavenging coefficients (i.e., 1×10^{-15}).

Vapor Phase Air Modeling Output

The vapor phase air modeling output generates vapor phase air concentrations and wet vapor depositions for organic COPCs. These values are used in estimating the media concentration for all organic COPCs and mercury except relatively non-volatile polycyclic aromatic hydrocarbons (PAHs) (i.e., vapor fraction less than five percent). Organic COPCs use the vapor phase data because the mass of the COPC emitted is assumed to have all or a portion of its mass in the vapor phase. The PAH benzo(a)pyrene has a vapor fraction of approximately 25 percent and is therefore modeled in the vapor phase. For the ISOCI facility, PAH data were not speciated, therefore, the concentration of PAHs was assumed to be benzo(a)pyrene. This is a conservative assumption, since benzo(a)pyrene is considered to have the most detrimental health effects of the PAHs.

Particle Phase Air Modeling Output

The particle phase air modeling output generates particle phase air concentrations, dry deposition, wet deposition, and combined deposition for inorganics and relatively non-volatile organic COPCs. These values are used in estimating media concentration for all inorganic COPCs (except mercury) and non-volatile PAHs that have a vapor fraction of less than five percent. Inorganic and relatively non-volatile COPCs use the particle phase data because the mass of the COPC emitted is assumed to have all of its mass in the particle phase, apportioned across the particle size distribution based on mass weighting. The majority of inorganic emissions from ISOCI occur from combustion of natural gas. Section 1.4.3 of the U.S. EPA Compilation of Air Pollutant Emission Factors (AP-42) identifies natural gas to generate low quantities of particulate matter. Particles are estimated to be less than one micron in diameter with no distribution given (U.S. EPA, July 1998). Therefore, particle phase modeling for natural combustion sources was not included in the modeling.

Particle-Bound Phase Air Modeling Output

The particle-bound phase air modeling output generates particle-bound phase air concentrations, dry deposition, wet deposition, and combined deposition for organic COPCs and mercury. These values are used in estimating media concentration for all organic COPCs and mercury condensed onto the surface of particulates. Organic COPCs and mercury use the particle-bound phase data because the mass of the COPC emitted is assumed to have a portion of its mass condensed on particulates, apportioned across the particle size distribution based on surface-area weighting. Since particle phase modeling was not included, particle-bound phase modeling was also not included in the modeling.

C. ISC Meteorological Data Options

Typically, meteorological data preprocessed by the SCAQMD is used when preparing HRAs in the Los Angeles basin. However, to conform to the HHRAP, upper air data is also required for the same year. These data were not available from the National Climatic Data Center. Therefore, data from 1984 were used from the Los Angeles International Airport for surface data and from the Oakland Airport for upper air data. Oakland Airport was used because it was the only California location available in the appropriate file format for use with the preprocessor.

The meteorological data used with the dispersion model has been preprocessed using the Lakes Environmental RAMMET View preprocessor. RAMMET View is the Lakes Environmental interface for the U.S. EPA meteorological preprocessor, PCRAMMET. PCRAMMET is a meteorological preprocessor used for preparing National Weather Service (NWS) data for use in the U.S. EPA short term air quality dispersion models including ISCST3.

The operations performed by PCRAMMET include calculating hourly values for atmospheric stability from meteorological surface observations; interpolating twice daily mixing heights to hourly values; optionally, calculating the parameters for dry and wet deposition processes; and, outputting data in an unformatted or ASCII format required by regulatory air quality dispersion models. The input data requirements for PCRAMMET depend on the dispersion model and the model options for which the data are being prepared.

A comparison of ISCST3 output for vapor phase data was performed. The 1984 data produced higher unitized concentrations at the receptors than the 1981 data. Therefore, use of the 1984 data is appropriate and conservative.

D. ISC Terrain Data

The terrain surrounding the facility is considered flat and well below the stack heights. Therefore, terrain heights are not included in the modeling. Flat terrain height was used with the simple and complex terrain algorithm.

E. ISC Output Types

Output types from the ISCST3 model included concentration, and dry, wet, and total deposition. These are necessary to quantify health risk in accordance with HHRAP.

VII. ESTIMATION OF MEDIA CONCENTRATIONS

The calculations of concentration in air for direct inhalation, concentration in soil, and concentration in produce are required to assess the exposure scenarios of adult and child resident and acute risk. For the infant scenario, the concentration of dioxins in breast milk is also needed.

A. Calculation of COPC Concentration in Air for Direct Inhalation

The air concentration for COPCs (except mercury) is the sum of the vapor phase and the particle phase air concentrations. For carcinogens and chronic non-cancer health effects, the concentration is calculated using:

$$C_a = Q \times [\, F_v \times Cyv + (1.0 - F_v) \times Cyp]$$

where, C_a = air concentration in micrograms per cubic meter ($\mu g/m^3$),
Q = COPC-specific emission rate in grams per second (g/s),
F_v = fraction of COPC air concentration in vapor phase (unitless),
Cyv = unitized annual air concentration from vapor phase ($\mu g\text{-}s/g\text{-}m^3$), and
Cyp = unitized annual air concentration from particle phase ($\mu g\text{-}s/g\text{-}m^3$).

For acute health effects, the concentration is calculated using:

$$C_{acute} = Q \times [\, F_v \times Cyv + (1.0 - F_v) \times Cyp]$$

where, C_{acute} = air concentration in micrograms per cubic meter ($\mu g/m^3$),
Cyv = unitized hourly air concentration from vapor phase ($\mu g\text{-}s/g\text{-}m^3$),
Cyp = unitized hourly air concentration from particle phase ($\mu g\text{-}s/g\text{-}m^3$), and
F_v = fraction of COPC air concentration in vapor phase (unitless).

For elemental mercury, the C_a equations becomes:

$$C_a = 0.002Q \times [\, F_v \times Cyv + (1.0 - F_v) \times Cyp], \text{ where, } F_v \text{ is } 1.0.$$

For divalent mercury, the C_a equation becomes:

$$C_a = 0.48Q \times [\, F_v \times Cyv + (1.0 - F_v) \times Cyp], \text{ where, } F_v \text{ is } 0.85.$$

For elemental mercury, the C_{acute} equation becomes:

$$C_{acute} = 0.002Q \times [\, F_v \times Cyv + (1.0 - F_v) \times Cyp], \text{ where, } F_v \text{ is } 1.0.$$

B. Calculation of COPC Concentration in Soil

The soil concentration is the sum of the vapor phase and particle phase deposition concentrations to the soil. Wet and dry deposition of particles and vapors are considered, with dry deposition of vapors calculated from the vapor air concentration and the dry deposition velocity. The soil

concentration calculation includes terms to account for loss of COPCs by leaching, erosion, runoff, degradation, and volatilization (U.S. EPA, 1998). For carcinogens and chronic non-cancer health effects, the concentration of soil associated with an adult resident exposure is calculated using:

$$C_s = \frac{((Ds \times tD - Cs_{tD})/ks) + (Cs_{tD}/ks \times [1 - \exp(-ks\ (T_2 - tD))]}{(T_2 - T_1)}$$

where, C_s = average soil concentration over exposure duration (mg COPC/kg soil),
Cs_{tD} = soil concentration at time tD (mg COPC/kg soil),
Ds = deposition term (mg COPC/kg soil-yr),
tD = time period over which deposition occurs (100 yrs),
ks = COPC soil loss constant due to all processes (yr^{-1}),
T_2 = length of exposure (30 years), and
T_1 = time period at the beginning of combustion (0 years).

For carcinogens and chronic non-cancer health effects, the concentration for a child resident is calculated using:

$$C_s = ((Ds/ks \times (tD - T_1)) \times ([tD + \exp(-ks \times tD)/ks\ ] - [\ T_1 + \exp(-ks \times T_1)/ks].$$

The soil concentration at time tD is calculated using:

$$Cs_{tD} = Ds \times [1 - \exp(-ks \times tD)]/ks.$$

The soil deposition term is calculated using:

$$Ds = 100 \times Q/Z_s \times BD \times [F_v \times (0.31536 \times Vdv \times Cyv + Dywv) + (Dydp + Dywp) \times (1 - F_v)]$$

where, Q = COPC-specific emission rate (g/s),
Z_s = soil mixing zone depth (untilled: 1 cm),
BD = soil bulk density (1.5 g soil/cm^3 soil),
F_v = fraction of COPC air concentration in vapor phase (unitless),
Vdv = dry deposition velocity (3 cm/s),
Cyv = unitized annual air concentration from vapor phase (μg-s/g-m^3),
$Dywv$ = unitized annual average wet deposition from vapor phase (s/m^2-yr),
$Dydp$ = unitized annual average dry deposition from particle phase (s/m^2-yr), and
$Dywp$ = unitized annual average wet deposition from particle phase (s/m^2-yr).

For mercury, the soil deposition term is calculated slightly differently. Refer to HHRAP, Appendix B, Table B-1-1.

The COPC soil loss constant is calculated using:

$$ks = ksg + kse + ksr + ksl + ksv$$

where, ks = COPC soil loss constant due to all processes (yr^{-1}),
ksg = COPC loss constant due to biotic and abiotic degradation (yr^{-1}) provided in Appendix A-3 of the HHRAP,
kse = COPC loss constant due to soil erosion (0 yr^{-1}),
ksr = COPC loss constant due to surface runoff (yr^{-1}),
ksl = COPC loss constant due to leaching (yr^{-1}), and
ksv = COPC loss constant due to volatilization (0 yr^{-1}).

The loss constant due to soil erosion (*kse*) is calculated using:

$$kse = \frac{0.1 \times X_e \times SD \times ER}{BD \times Z_s} \times \left[\frac{Kd_s \times BD}{\theta_{sw} + (Kd_s \times BD)} \right]$$

where, X_e = unit soil loss (kg/m^2-yr),
SD = sediment delivery ratio (unitless),
ER = soil enrichment ratio (inorganics: 1, organics: 3),
BD = bulk density (1.5 g soil/ cm^3 soil),
Z_s = soil mixing depth (untilled: 1 cm),
Kd_s = soil-water partition coefficient (cm^3 water/g soil) provided in Appendix A-3 of the HHRAP, and
θ_{sw} = soil volumetric water content (0.2 cm^3 water/cm^3 soil).

The loss constant due to runoff (*ksr*) is calculated using:

$$ksr = \frac{RO}{\theta_{sw} \times Z_s} \times \left[\frac{1}{1 + (Kd_s \times BD/\theta_{sw})} \right]$$

where, RO = annual surface runoff from pervious areas (cm/yr),
θ_{sw} = soil volumetric water content (0.2 cm^3 water/cm^3 soil),
Z_s = soil mixing depth (untilled: 1 cm),
Kd_s = soil-water partition coefficient (cm^3 water/g soil) provided in Appendix A-3 of the HHRAP, and
BD = bulk density (1.5 g soil/ cm^3 soil).

The loss constant due to leaching (*ksl*) is calculated using:

$$ksl = \frac{P + \mathrm{I} - RO - E_v}{\theta_{sw} \times Z_s \times [1.0 + (BD \times Kd_s/\theta_{sw})]}$$

where, P = average annual precipitation (35 cm/yr),
I = average annual irrigation (100 cm/yr),

RO = annual surface runoff from pervious areas (cm/yr),
E_v = annual average evapotranspiration (50 cm/yr),
θ_{sw} = soil volumetric water content (0.2 cm^3 water/cm^3 soil),
Z_s = soil mixing depth (untilled: 1 cm),
BD = bulk density (1.5 g soil/ cm^3 soil), and
Kd_s = soil-water partition coefficient (cm^3 water/g soil) provided in Appendix A-3 of the HHRAP.

C. Calculation of COPC Concentrations in Produce

Indirect exposure also results from the ingestion of produce. Produce concentrations can be affected by the leafy, fruit, and tuber portions of the plant, which separates produce into two groups – aboveground and belowground produce.

Aboveground Produce

Aboveground produce is divided into two subgroups – exposed and protected (edible portion is in a shell, pod, or husk). Aboveground exposed produce is assumed to be contaminated by three possible mechanisms – direct deposition of particles, vapor transfer to plant foliage, and root uptake through soil transfer. Aboveground protected produce is only affected by root uptake because no direct contact is made with the edible portion of the plant.

The concentration in aboveground produce due to direct deposition (Pd) is calculated using:

$$Pd = 1{,}000 \times Q \times (1 - F_v) \times [Dydp + (Fw \times Dywp)] \times RP \times [1.0 - \exp(-kp \times Tp)]/Yp \times kp$$

where, Pd = concentration of COPC in aboveground produce due to direct (wet and dry) deposition (mg COPC/kg DW),
Q = COPC-specific emission rate (g/s),
F_v = fraction of COPC air concentration in vapor phase (unitless),
$Dydp$ = unitized annual average dry deposition from particle phase (s/m^2-yr),
Fw = fraction of COPC wet deposition that adheres to plant surface (unitless),
$Dywp$ = unitized annual average wet deposition from particle phase (s/m^2-yr),
RP = interception fraction of the edible portion of plant (0.39),
kp = plant surface loss coefficient (18 yr^{-1}),
Tp = length of plant exposure to deposition per harvest of edible portion of plant (0.164 yr), and
Yp = yield or standing crop biomass of the edible portion of the plant (productivity) (2.24 kg DW/m^2).

The concentration in aboveground produce due to vapor transfer from the air to plant foliage (Pv) is calculated using:

$$Pv = Q \times F_v \times Cyv \times Bv_{ag} \times VG_{ag}/\rho_a$$

where, Pv = concentration of COPC in aboveground produce due to air-to-plant transfer (mg COPC/kg DW),
Q = COPC-specific emission rate (g/s),
F_v = fraction of COPC air concentration in vapor phase (unitless),
Cyv = unitized annual air concentration from vapor phase (μg-s/g-m^3),
Bv_{ag} = COPC air-to-plant factor for aboveground produce (unitless) provided in Appendix A-3 of the HHRAP,
VG_{ag} = empirical correction factor (0.01 or 1.0 for log K_{ow} > 4 and < 4, respectively), and
ρ_a = density of air (1200.0 g/m^3).

The concentration in aboveground produce due to root uptake (Pr_{ag}) is calculated using:

$$Pr_{ag} = Cs \times BR_{ag}$$

where, Pr_{ag} = concentration of COPC in aboveground produce due to root uptake (mg COPC/kg DW),
Cs = average soil concentration over exposure duration (mg COPC/kg soil), and
BR_{ag} = plant-soil bioconcentration factor for aboveground produce (unitless) provided in Appendix A-3 of the HHRAP.

Belowground Produce

The concentration in belowground produce (e.g., carrots or potatoes) due to direct uptake of COPC from soil (Pr_{bg}) is calculated using:

$$Pr_{bg} = Cs \times BR_{rootveg} \times VG_{rootveg}$$

where, Pr_{bg} = concentration of COPC in belowground produce due to root uptake (mg COPC/kg DW),
Cs = average soil concentration over exposure duration (mg COPC/kg soil),
$BR_{rootveg}$ = plant-soil bioconcentration factor for aboveground produce (unitless) provided in Appendix A-3 of the HHRAP, and
$VG_{rootveg}$ = empirical correction factor for belowground produce (0.01 or 1.0 for log K_{ow} > 4 and < 4, respectively).

D. Quantifying Exposure

Exposures quantified in risk assessments are based on a unitized time and body weight expressed in units of milligrams per kilogram of body weight per day (mg/kg-day) and are termed "intakes" or "doses." The intake is pathway specific and the overall intake is the sum of the pathway doses for a given scenario. The exposures calculated in a risk assessment are intended to represent reasonable maximum exposure conditions at a receptor.

E. Intake from Soil

Intake from soil is calculated using:

$$I_{soil} = Cs \times Cr_{soil} \times F_{soil} / BW$$

where, I_{soil} = daily intake of COPC from soil (mg/kg-day),
Cs = average soil concentration over exposure duration (mg/kg),
Cr_{soil} = consumption rate of soil (adult: 0.001 kg/day, child: 0.0002 kg/day),
F_{soil} = fraction of soil that is contaminated (1.0), and
BW = body weight (adult: 70 kg, child: 15 kg).

F. Intake from Produce

Intake from produce is calculated using:

$$I_{ag} = [((Pd + Pv + \mathrm{Pr}) \times Cr_{ag} + (Pr \times Cr_{pp}) + (Pr_{bg} \times Cr_{bg}) \times F_{ag}$$

where, I_{ag} = daily intake of COPC from produce (mg/kg-day),
Pd = average exposed produce concentration due to direct deposition (mg/kg),
Pv = average exposed produce concentration due to air-to-plant transfer (mg/kg),
Pr = average exposed and protected produce concentration due to root uptake(mg/kg),
Pr_{bg} = belowground produce concentration due to root uptake (mg/kg),
Cr_{ag} = consumption rate of aboveground exposed produce (adult: 0.0003 kg/kg-day DW, child: 0.00042 kg/kg-day DW),
Cr_{pp} = consumption rate of aboveground protected produce (adult: 0.00057 kg/kg-day DW, child: 0.00077 kg/kg-day DW),
Cr_{bg} = consumption rate of belowground produce (adult: 0.00014 kg/kg-day DW, child: 0.00022 kg/kg-day DW), and
F_{ag} = fraction of produce that is contaminated (adult/child resident: 0.25).

G. Intake from Inhalation

Intake from inhalation for carcinogens and chronic non-carcinogens is calculated using:

$$ADI = C_a \times IR \times ET \times EF \times ED \times 0.001/BW \times AT \times 365)$$

where, ADI = average daily intake of COPC via inhalation (mg/kg-day),
C_a = total COPC air concentration ($\mu g/m^3$),
IR = inhalation rate (adult: 0.63 m^3/hr, child: 0.30 m^3/hr),
ET = exposure time (24 hrs/day),
EF = exposure frequency (350 days/yr),
ED = exposure duration (adult: 30 yrs, child: 6 yrs),

BW	=	body weight (adult: 70 kg, child: 15 kg),
AT	=	averaging time (carcinogens: 70 yrs, chronic non-carcinogens: same as *ED*).

VIII. RISK AND HAZARD CHARACTERIZATION

Risk is the sum at each receptor of all applicable pathways for each COPC from each source at the facility. The IRAP-h View (IRAP) model by Lakes Environmental is used to calculate the risk at each receptor. IRAP is designed to perform the calculations presented in the HHRAP and this HRA. Source-specific emission rates for each COPC are presented in Appendix A.

A. Quantitative Estimation of Cancer Risk

Carcinogenic risk estimates represent the incremental probability that an individual will develop cancer over a lifetime as a result of a specific exposure (U.S. EPA, 1998). Cancer risk for a COPC by pathway is calculated using:

$$Cancer\ Risk = LADD \times CSF$$

where, $LADD$ = Lifetime average daily dose (mg/kg-day), and
CSF = Cancer slope factor ((mg/kg-day)$^{-1}$).

The total cancer risk at a single receptor location is the sum of all cancer risks for all COPCs for all exposure pathways. The cancer slope factors used are the OEHHA-published values unless no factors have been established by OEHHA (see Table 5). For COPCs where no OEHHA values are available, U.S. EPA values are used. The receptor data is evaluated to identify the RME at the residential and occupational (worker) locations.

Reasonable Maximum Exposed Resident

The health risk modeling results predict an estimated increase in cancer risk to the Reasonable Maximum Exposed Resident (RMER) due to potential exposure to COPCs from the ISOCI facility to be 1.16 x 10^{-6} or 1.2 in a million. The RMER is located about 0.25 miles northeast of the facility and shown in Figure 6. As shown in Table 6, approximately 48.6 percent of the cancer risk to the RMER is attributed to exposure to benzene emissions. The inhalation pathway constitutes approximately 99.6 percent the incremental cancer risk increase, (see Table 7). Source contribution analysis indicates that fugitive emissions from tanks 21 through 27 (Source OILTREAT) contribute approximately 46.4 percent to the RMER incremental cancer risk increase, followed by 31.6 percent from solid waste drums fugitive emissions(Source DRUMS)(Table 8).

Reasonable Maximum Exposed Worker

The incremental increase in cancer risk to the Reasonable Maximum Exposed Worker (RMEW) due to potential exposure to chemicals of concern from the ISOCI facility is estimated to be 5.78 x 10^{-6} or about 5.8 in a million. The RMEW is located northeast of the facility adjacent to the railroad tracks (see Figure 6). As shown in Table 9, approximately 44.8 percent of the cancer risk to the RMEW is attributed to exposure to benzene emissions. The inhalation pathway accounts for approximately 99.6 percent of the incremental cancer risk increase (see Table 10). Source contribution analysis indicates that fugitive emissions from tanks 21 through 27 (Source

OILTREAT) contribute approximately 43.8 percent to the RMEW incremental cancer risk increase, followed by 23.3 percent from solid waste drums fugitive emissions(Source DRUMS)(Table 11).

The cancer risk at the RMEW is adjusted to account for the reductions in exposure duration, exposure frequency, and soil ingestion rate. The cancer risk output from IRAP is for an adult resident. Therefore, the inhalation cancer risk value for the RMEW location is adjusted by:

$$\text{RMEW Inhalation Cancer Risk} = CancerRisk_I \times AF_{ED} \times AF_{EF}$$

where, $CancerRisk_I$ = adult resident cancer risk from the inhalation pathway,
AF_{ED} = exposure frequency adjustment factor (250 days/350 days), and
AF_{EF} = exposure duration adjustment factor (25 years/30years).

The soil ingestion cancer risk value for the RMEW location is adjusted by:

$$\text{RMEW Soil Ingestion Cancer Risk} = CancerRisk_S \times AF_{ED} \times AF_{EF} \times AF_{SI}$$

where, $CancerRisk_{SI}$ = adult resident cancer risk from the soil ingestion pathway,
AF_{ED} = exposure frequency adjustment factor (250 days/350 days),
AF_{EF} = exposure duration adjustment factor (25 years/30years), and
AF_{SI} = daily soil ingestion adjustment factor (0.0005 kg/0.001 kg).

Cancer risk associated with the ingestion of homegrown produce is not considered an appropriate pathway for occupational exposures, since produce is not typically grown at industrial facilities. Therefore, the produce pathway contribution to cancer risk is not included for the RMEW (see Table 10).

Sensitive Receptors

Table 12 presents the 11 sensitive receptor locations that have been identified in the vicinity of the ISOCI facility and the potential incremental cancer risk for adult residents and child residents. The locations of the sensitive receptors are shown in Figure 7. The maximum exposed sensitive receptor is the Lou Costello Jr. Recreation Center with a potential incremental cancer risk of 1.04 x 10^{-6} or 1.0 in a million for adult residents and 0.47 x 10^{-6} or 0.5 in a million for child residents. As shown in Table 13, approximately 48 percent of the cancer risk to adult and child residence is attributed to exposure to benzene emissions. The inhalation pathway accounts for approximately 99 percent of the incremental cancer risk increase for both adult and child residence (see Table 14). Source contribution analysis indicates that fugitive emissions from tanks 21 through 27 (Source OILTREAT) contribute approximately 46 percent to both the adult and child residence incremental cancer risk increase, followed by 29 percent from solid waste drums fugitive emissions (Source DRUMS)(Table 15).

B. Quantitative Estimation of Non-Cancer Chronic Effects

The ISOCI facility emits pollutants which may have chronic health effects (see Table 4). To assess cumulative impacts, the estimated daily intake for each pollutant was compared to the chronic reference dose for oral exposure and chronic reference concentration for inhalation exposure, using:

$$HQ = ADD/RfD \quad \text{or} \quad HQ = C_a/RfC$$

where, HQ = hazard quotient (unitless),
ADD = average daily dose (mg/kg-day),
C_a = total COPC air concentration (mg/m^3),
RfD = reference dose (mg/kg-day), and
RfC = reference concentration (mg/m^3).

The hazard quotient for each COPC and each pathway are summed for each receptor to produce the total hazard quotient (HQ). This method of calculation assumes the health effects from multiple COPCs and pathways are additive and that all COPCs equally impact the various target organs (e.g., lung, kidneys, liver, etc.). This assumption provides an initial screen of health impacts and is a health conservative assumption but is generally not true since compounds usually impact specific organs. Therefore, the total HQ may overestimate the potential for noncarcinogenic health effects.

The maximum chronic total hazard quotient receptor location is the same as the RMEW location and is shown in Figure 6. As shown in Table 16, the maximum total hazard quotient is 0.0188. Exposure to formaldehyde provides the largest contribution of 37.7 percent followed by ethylene dibromide contributing approximately 26.4 percent to the total hazard quotient. Emissions from the solid waste drums (Source DRUMS) provide the major contribution (40 percent) to the total chronic hazard quotient.

C. Quantitative Estimation of Acute Effects

In addition to long-term chronic effects, short-term or acute effects are also considered from direct inhalation of vapors and particle phases of COPCs. Acute effects are evaluated based on maximum 1-hour emission rates. The RELs for acute exposure used are those published by OEHHA and U.S. EPA for COPCs where OEHHA has not published a value. The acute HQ is calculated in a similar manner as the chronic HQ using:

$$AHQ_{inh} = C_{acute} \times 0.001 / AIEC$$

where, AHQ_{inh} = acute hazard quotient (unitless),
C_{acute} = acute air concentration (μg/m^3), and
$AIEC$ = acute inhalation exposure criteria (mg/m^3).

The maximum acute hazard quotient receptor location is in the same location as the RMEW location and is shown in Figure 6. As shown in Table 17, the maximum acute hazard quotient is 1.06×10^{-2}. Exposure to chloroform provides the largest contribution to the acute hazard quotient

(approximately 96 percent). Emissions from solid waste drums (Source DRUMS) provides the major contribution (84.4 percent) to the total hazard quotient.

D. IRAP Results

IRAP creates tables summarizing the results for each receptor. Appendix B contains output tables from IRAP for the Cumulative Risk by COPC and Pathway Risk for all receptor locations. As some of the tables from IRAP are in excess of 500 pages, excerpts for the maximum impact location (i.e., the RMER and/or the RMEW) are also included in Appendix B. Excerpts from the IRAP tables include Air Concentrations and Acute Inhalation Hazard Quotient by Source and COPC. The modified parameters for the COPCs are also included. The complete model, modeling results, input and output files are available from the DTSC in electronic format and are available for review.

IX. UNCERTAINTY INTERPRETATION

The discussion of uncertainty is presented in compliance with the HHRAP developed by the U.S. EPA (1998). There is a great deal of uncertainty associated with the risk assessment process. A wide range of data in a variety of disciplines is required to estimate health risks associated with exposure to air contaminants. Uncertainty is inherent in the risk assessment process even if the most accurate data with the most sophisticated models are used. In general, conservative risk estimates have been used where there are uncertainties in the data and, thus, the risks are expected to be over estimated. Sources of uncertainty are identified below and summarized in Table 18**.**

A. Emission Estimates

Emission estimates from all point (stack) sources have been based on vapor space sampling of storage tanks, which is expected to provide an accurate representation of the emissions from the site. Fugitive emissions are expected to have uncertainty since the accuracy of the emission factors used is difficult to validate.

There also is little uncertainty in the speciation of COPCs since the emissions from the facility are based on the results of source testing.

B. Air Dispersion and Deposition Modeling

Air quality models are mathematical models used to predict ground level concentrations of contaminants. These models and the assumptions used generally over estimate air quality impacts. The meteorological data for 1984 allow the ISCST3 model to appropriately process upper air data required for particle and particle-bound phases. The upper air data will have little to no effect on the results given the low stack heights (not greater than 115 feet) at the ISOCI facility. The ISCST3 model is approved by the U.S. EPA and SCAQMD for modeling this type of facility. The model is expected to provide a fairly accurate representation of impacts.

The health risk assessment assumed that volatile organic compounds do not deposit and, therefore, are not multipathway contaminants. This is a realistic assumption, which is not expected to over or under estimate the true risk. It has been well documented that volatile organic compounds are not expected to accumulate in soil (U.S. EPA 1998). Therefore, this assumption is not expected to over or under estimate risks.

C. Exposure Assessment

Uncertainties in the exposure assessment include changes in land use, appropriateness of exposure pathways, effect of emissions on indoor air quality, and use of standard assumptions.

Changes in Land Use

Uncertainties regarding the current and future land use of the site are expected to be minimal, since the area surrounding the ISOCI facility is expected to remain industrial. Encroachment by residential areas towards the ISOCI facility is expected to be limited to the Sears Building site at the

corner of Olympic Boulevard and Soto Street. Residential areas closer than that are not expected due to the proximity to the railroad and other industrial facilities.

Appropriateness of Exposure Pathways

There is little uncertainty that the inhalation pathway is a potential exposure pathway to COPCs emitted from the ISOCI facility, since volatile organic compounds can migrate through the air. Additional pathways (i.e., soil ingestion, ingestion of potentially contaminated produce, and ingestion of mother's milk) are included in the HRA because they are potential pathways. The elimination of other pathways (e.g., ingestion of drinking water, etc.) is not expected to under estimate the risks because human exposure to media other than air and soil has not been demonstrated and is not expected.

Effect of Emissions on Indoor Air Quality

There is a lack of information on indoor/outdoor ratios of contaminant concentrations and related differences in health impacts. No assumptions were made for a reduction or increase in emissions exposure due to the indoor environment. Residents and workers were assumed to be exposed to the outdoor estimated ambient air concentrations on a continuous basis.

Use of Standard Assumptions

Conservative assumptions on exposure likely overestimate the risk since residents are assumed to be exposed for 24 hour per day, 350 days per year for 30 years. Residents usually leave their houses on a daily basis for work, shopping, errands, vacation, etc. However, the calculation of lifetime cancer risk based on a 30-year exposure for residents could underestimate the risk if residents live in the area for a longer period of time.

The accuracy of the exposure prediction as a function of time, location, and other model inaccuracies is uncertain.

Standard assumptions regarding body weight, exposure periods, life expectancy, population characteristics and lifestyle have been based on average or median values. The assumptions used for these parameters may not be representative of the actual exposure characteristics of individuals within the population. For example, the inhalation rate for individuals is expected to vary, the individual body weight varies, the amount of soil consumed by a child varies, the amount of ingested homegrown vegetables varies and so forth. The values used herein are expected to provide a reasonable estimate of the population and are not expected to underestimate risk on the average.

There is uncertainty and little scientific documentation for certain environmental parameters used herein. The amount of air contaminants that deposit on vegetables (interception fraction) has not been well defined. The absorption of compounds from the soil into homegrown produce is based on studies completed on radioactive isotopes. The model to estimate the concentration of air contaminants in the soil has not been verified. The values used herein are expected to provide a reasonable estimate of the population and are not expected to underestimate risk on the average.

Since these data are based on a large number of assumptions that have not been verified, the level of uncertainty is moderate to high.

D. Toxicity Data

There are many uncertainties in the development of toxicity data for many compounds considered in this HRA, which include the following:

Lack of conclusive toxicological data on the human health effects for all compounds considered in the HRA. Most of the cancer potency slope factors unit risk factors, and reference doses are based on the results of animal studies. This assumption potentially leads to a large degree of uncertainty in the HRA.

Uncertainties in models used for interspecies extrapolation from high doses in exposed animals to low doses in exposed humans. This is a primary concern with development of potency slope and unit risk factors. This assumption potentially lead to a large degree of uncertainty in the HRA although it is estimated that the risk would be largely overestimated rather than underestimated due to the conservative nature of the interspecies extrapolation models.

Uncertainties in the applicability of the results of animal studies conducted at high exposure levels to predict human health effects at low exposure levels due to differences in genetics, absorption, distribution, storage, activation, detoxification, metabolism, repair mechanisms, etc. This assumption potentially leads to a large degree of uncertainty in the HRA.

Uncertainties in using dose-response information from short-term exposure studies to predict the effect of long-term exposures. This assumption potentially leads to a large degree of uncertainty in the HRA.

Lack of data on absorption efficiencies for most compounds. Lack of information on absorption efficiencies potentially leads to a large degree of uncertainty in the HRA.

Conflicting data on health effects between animal species and humans. The lack of understanding of health effects between animals and humans potentially leads to a large degree of uncertainty in the HRA.

Lack of knowledge about interactions from simultaneous exposures to a number of compounds, i.e., synergistic or antagonistic effects which could over or under estimate the health risks. The HRA assumed that the cancer risks and the non-cancer risks were additive. Data to assess chemical interactions on the human body are generally lacking (U.S. EPA 1998).

Lack of information on the health effects to each pathway. For example, there is evidence that exposure to certain chemicals via inhalation can cause cancer (arsenic and cadmium). However, exposure to these same compounds via other pathways does not appear to have the same health effect.

The presence of uncertainty is inherent in the risk assessment process. Despite the uncertainties identified above, this risk assessment used scientifically supported assumptions, when available, and worst case or conservative assumptions when little or no data were available. The results of the HRA must be reviewed and carefully interpreted, considering these data limitations. Risk estimates generated in the risk assessment should not be construed as the expected rates of disease, but are merely estimates of risks, based on current knowledge and a large number of assumptions.

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TABLES

TABLE 1

ISOCI PROJECT DESCRIPTION SUMMARY

EXISTING FACILITY OPERATIONS	PROPOSED FACILITY OPERATIONS
Waste Handled Waste/Used Oil Oil/Water Mixtures Antifreeze California Waste Codes 221, 222, 223, 134 & 135	Waste Handled Same as Existing Additional RCRA Waste Codes (see Appendix B)
Treatment Operations Oil Treatment: *64,000 gal./day	Treatment Operations — Treatment Capacity Oil Treatment: Upgrade to existing operations — 228,600 gal/day Wastewater Treatment — 84,600 gal/day Fuel Blending — 25,000 gal/day Glycol Recovery — 86,400 gal/day Railcar Loading/Unloading — 150,000 gal/day Waste Solids Treatment — 14,400 gal/day
Container Storage = 100,000 gal. Railcar Storage = 125,000 gal.	Container Storage = 46,200 gal. - Total Railcar Storage = 250,000 gal. - Total
Secondary Containment on all tanks and units, Activation of one railspur for hazardous waste activities.	Secondary Containment on all tanks and units. Activation of one railspur for hazardous waste activities.
45 trucks/day 2 rail spurs (hazardous waste & product) 5 railcars per/day	100 trucks/day - Total 2 rail spurs (both hazardous waste) 10 railcars/day 35 railcars/week
Site size = 2.2 acres	Site size = 2.7 acres

TABLE 1 (CONT.)

EXISTING FACILITY CONFIGURATION

Existing Tank Configuration:

Tank NO.	Contents	Function [1]	Capacity[2]
21	Used Oil	R/S/T	28,064
22	Used Oil	R/S/T	31,071
23	Used Oil	R/S/T	31,071
24	Used Oil	R/S/T	28,064
25	Used Oil	R/S/T	28,064
26	Used Oil	R/S/T	28,064
27	Used Oil	R/S/T	28,064
40	Used Oil	R/S	20,293
41	Used Oil	R/S	20,293
42	Used Oil	R/S	19,458
43	Used Oil	R/S	19,458
47	Waste Antifreeze	R/S	6,143
50	Used Oil & Water	S/T	6,143
4	Used Oil	R/S/T	2,114
5	Used Oil	R/S/T	2,114

Chemical Reagent tanks not listed

298,478 Gallon Capacity for Regulated Tanks

Non-regulated tanks

100	Used/Recycled Oil	S	71,025
200	Used/Recycled Oil	S	71,025
300	Used/Recycled Oil	S	71,025
400	Used/Recycled Oil	S	71,025
500	Used/Recycled Oil	S	71,025
600	Used/Recycled Oil	S	71,025
700	Used/Recycled Oil	S	71,025

497,175 Gallon Capacity for Non-Regulated Tanks

Total Existing Tank Capacity

795,653 gal.

1 Tank Function: R –Receiving S – Storage T - Treatment
2 Capacity in gallons

PROPOSED FACILITY OPERATIONS

Proposed Tank Configuration:

Reassignment of Existing Tanks:

Tank NO.	Contents	Function [1]	Capacity[2]
100	Used/Recycled Oil	S	71,025
200	Used/Recycled Oil	S	71,025
300	Used/Recycled Oil	S	71,025
400	Used/Recycled Oil	S	71,025
500	Used/Recycled Oil	S	71,025
600	Used/Recycled Oil/ RCRA Waste	R/S/T	71,025
700	Used/Recycled Oil	S	71,025
21	Oil Treatment	R/S/T	28,064
22	Oil Treatment	R/S/T	31,071
23	Oil Treatment	R/S/T	31,071
24	Oil Treatment	R/S/T	28,064
25	Oil Treatment	R/S/T	28,064
26	Oil Treatment	R/S/T	28,064
27	Oil Treatment	R/S/T	28,064
40	Oily Wastewater/ Antifreeze/ Waste Glycol	R/S	20,093
41	Oil Treatment	R/S	20,093
42	Oil Treatment Treatment/Oxidation	R/S	19,458
43	Used Oil & Water	R/S	19,458
47	Antifreeze/Chemical Product	R	6,143
50	Used Oil & Wastewater (recirculation tank)	S/T	6,143

791,425 Gallon Capacity for Regulated Tanks

Non-regulated tanks

4	Used Oil/Glycol Product/ Chemical Reagent	S	2,114
5	Used Oil/Glycol Product/ Chemical Reagent	S	2,114

4,228 Gallon Capacity for Non-Regulated Tanks

Proposed Tank Configuration (cont.):

Proposed New Tanks:

Tank NO.	Contents	Function [1]	Capacity [2]
800	Spill Containment	S	58,748
44	Wastewater/Antifreeze/ Waste Glycol (RCRA)	R/S	20,150
45	Wastewater/Antifreeze/ Waste Glycol (RCRA)	R/S	20,150
46	Oily Wastewater/Antifreeze/ Waste Glycol	S	20,150
48	Oily Wastewater/Antifreeze/ Waste Glycol	R/S	20,150
49	Oily Wastewater/Antifreeze/ Waste Glycol	R/S	20,150
51	Antifreeze/Waste Glycol	R/S	20,150
52	Oily Wastewater Treatment/Oxidation	S/T	20,150
53	Oily Wastewater Treatment/Oxidation	S/T	
54	Oily Wastewater Treatment/Oxidation	S/T	20,150
56	Sludge Thickening	R/S/T	10,000
OWS-150	Oil/Water Separation	S/T	1,786
CFT	Coagulation/Flocculation	S/T	1,650
DAF	Dissolved Air Floatation	S/T	3,000
T-1	Vapor Compression Tower	T	317
T-2	Glycol Distillation Tower	T	660
T-3/E-5	Glycol Side Stripper/Reboiler	T	264
V-1	T-1 Reflux	T	140
V-2	T-2 Reflux	T	140
WT-2	Brine	T	52
WT-3	Effluent	T	500
WT-5	Sludge Conditioning	T	2,000
WT-6	Sludge Collection	T	500

261,107 Gallon Capacity for Regulated Tanks

Non-regulated tanks

55	Glycol Products	R/S	10,000
WT-1	Chemical Product	T	500
WT-4	Pre-Coat	T	500

11,000 Gallons Capacity for Non-Regulated Tanks

Total Proposed Regulated Tank Capacity:	1,052,532 gal.
Total Proposed Non-Regulated Tank Capacity:	15,228 gal.
Total Proposed Tank Capacity:	**1,067,760 gal.**

TABLE 2

FACILITY HAZARDOUS WASTE UNITS & WASTE CODES

FACILITY PROCESS SYSTEM DESCRIPTION	WASTE CODE
CONTAINER MANAGEMENT AREA 1	D005, D006, D007, D008, D010 F037, F038, K048, K049, K051, K052, 133, 134, 135, 211, 221, 222, 223, 241, 251, 252, 351, 352, 451, 512, 513, 612
CONTAINER MANAGEMENT AREA 7	D001, D002, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, DO38, D039, D040, D041, D042, DO43, F001, F002, F003, F004, F005, F006, F007, F008, F009, F010, F011, F012, F019, F024, F025, F037, F038, K002, K003, K004, K005, K006, K007, K008, K009, K010, K014, K015, K016, K017, K018, K019, K020, K021, K022, K023, K024, K025, K026, K028, K029, K030, K031, K032, K033, K034, K035, K036, K037, K038, K039, K040, K041, K042, K043, K046, K048, K049, K050, KO51, K052, K060, K061, K062, K064, K065, K066, K069, K071, K073, K083, K084, K085, K086, K087, K088, K090, K091, K093, K094, K095, K096, K097, K098, K099, K100, K101, K102, K103, K104, K105, K106, K107, K108, K109, K110, K111, K112, K113, K114, K115, K116, K117, K118, K123, K124, K125, K126, K136, K141, K142, K143, K144, K145, K1147, K148, K149, K150, K151, K156, K157, K158, K159, K160, K161, U002, U003, U004, U005, U007, U009, U010, U011, U012, U014, U015, U016, U017, U018, U019, U021, U022, U024, U025, U026, U027, U028, U029, U030, U031, U032, U034, U035, U036, U037, U038, U039, U041, U042, U043, U044, U045, U046, U047, U048, U049, U050, U051, U052, U053, U055, U056, U057, U058, U059, U060, U061, U062, U063, U064, U066, U067, U068, U069, U070, U071, U072, U073, U074, U075, U076, U077, U078, U079, U080, U081, U082, U083, U084, U085, U086, U087, U088, U089, U090, U091, U092, U093, U094, U095, U097, U098, U099, U101, U102, U103, U105, U106, U107, U108, U109, U110, U111, U112, U113, U114, U116, U117, U118, U119, U120, U121, U122, U124, U125, U126, U127, U128, U129, U130, U131, U132, U134, U136, U137, U138, U140, U141, U142, U143, U144, U145, U146, U147, U148, U149, U150, U151, U152, U153, U154, U155, U156, U157, U158, U159, U161, U163, U164, U165, U166, U167, U168, U169, U170, U171, U172, U173, U174, U176, U177, U178, U179, U180, U181, U182, U183, U184, U185, U186, U187, U188, U190, U191, U192, U193, U194, U196, U197, U200, U201, U202, U203, U204, U206, U207, U208, U209, U210, U211, U212, U214, U215, U216, U217, U218, U219, U220, U221, U222, U225, U226, U227, U228, U235, U236, U237, U238, U239, U240, U243, U244, U246, U247, U248, U249, U328, U353, U359, 121, 122, 123, 131, 132, 133, 134, 135, 141, 151, 161, 162, 171, 172, 181, 211, 212, 213, 214, 221, 222, 223, 231, 232, 241, 251, 252, 271, 272, 281, 291, 311, 331, 341, 342, 343, 351, 352, 411, 421, 431, 441, 451, 461, 471, 481, 491, 512, 513, 521, 541, 551, 561 571, 581, 591, 611, 612, 613, 711, 721, 722, 723, 724, 725, 726, 727, 728, 741, 751

TABLE 2 (cont.)

FACILITY PROCESS SYSTEM DESCRIPTION	WASTE CODE
WASTEWATER TREATMENT SYSTEM	D005, D006, D007, D008, D011, 121, 122, 123, 131, 132, 133, 134, 135, 722, 723, 724, 726
OIL TREATMENT SYSTEM	133, 134, 221, 222, 223, 241
FUEL BLENDING	D001, D004, D005, D006, D007, D008, DOO9, D009, DO10, D011, DO12, D013, D014, D015, D016, D017, D018, D019, D021, D022, ED023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, F001, F002, F003, F005, F010, F011, F025, F037, F038, K010, K048, K049, K050, KO51, K052, K104, K105, K111, K112, K113, U002, U042, U043, U044, U045, U078, U079, U154, U165, U207, U208, U209, U210, U211, U220, U226, U227, U228, U239, U359, 121, 122, 123, 131, 132, 141, 161, 162, 181, 211, 212, 213, 214, 221, 222, 223, 231, 232, 241, 251, 252, 271, 272, 281, 291, 331, 341, 343, 351, 352, 451, 461, 471, 491, 541, 561, 711, 721, 722, 723, 724, 725, 726, 727, 728, 741
GLYCOL DISTILLATION & ANTI-FREEZE FILTRATION	133, 134, 135
RAILCAR LOADING AND UNLOADING	D001, D002, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043, F001, F002, F003, F004, F005, F006, F007, F008, F009, F010, F011, F012, F019, F024, F025, F037, F038, K002, K003, K004, K005, K006, K007, K008, K009, K010, K014, K015, K016, K017, K018, K019, K020, K021, K022, K023, K024, K025, K026, K028, K029, K030, K031, K032, K033, K034, K035, K036, K037, K038, K039, K040, K041, K042, K043, K046, K048, K049, K050, K051, K052, K060, K061, K062, K064, K065, K066, K069, K071, K073, K083, K084, K085, K086, K087, K088, K090, K091, K093, K094, K095, K096, K097, K098, K099, K100, K101, K102, K103, K104, K105, K106, K107, K108, K109, K110, K111, K112, K113, K114, K115, K116, K117, K118, K123, K124, K125, K126, K136, K141, K142, K143, K144, K145, K147, K148, K149, K150, K151, K156, K157, K158, K159, K160, K161, U002, U003, U004, U005, U007, U009, U010, U011, U012, U014, U015, U016, U017, U018, U019, U021, U022, U024, U025, U026, U027, U028, U029, U030, U031, U032, U034, U035, U036, U037, U038, U039, U041, U042, U043, U044, U045, U046, U047, U048, U049, U050, U051, U052, U053, U055, U056, U057, U058, U059, U060, U061, U062, U063, U064, U066, U067, U068, U069, U070, U071, U072, U073, U074, U075, U076, U077, U078, U079, U080, U081, U082, U083, U084, U085, U086, U087, U088, U089, U090, U091, U092, U093, U094, U095, U097, U098, U099, U101, U102, U103, U105, U106, U107, U108, U109, U110, U111, U112, U113, U114, U116, U117, U118, U119, U120, U121, U122, U124, U125, U126, U127, U128, U129, U130, U131, U132, U134, U136, U137, U138, U140, U141, U142, U143, U144, U145, U146, U147, U148, U149, U150, U151, U152, U153, U154, U155, U156, U157, U158, U159, U161, U163, U164, U165, U166, U167, U168, U169, U170, U171, U172, U173, U174, U176, U177, U178, U179, U180, U181, U182, U183, U184, U185, U186, U187, U188, U190, U191, U192, U193, U194, U196, U197, U200, U201, U202, U203, U204, U206, U207, U208, U209, U210, U211, U212, U214, U215, U216, U217, U218, U219, U220, U221,

TABLE 2 (cont.)

FACILITY PROCESS SYSTEM DESCRIPTION	WASTE CODE
RAILCAR LOADING AND UNLOADING (Continued))	U222, U225, U226, U227, U228, U235, U236, U237, U238, U239, U240, U243, U244, U246, U247, U248, U249, U328, U353, U359, 121, 122, 123, 131, 132, 133, 134, 135, 141, 151, 161, 162, 171, 172, 181, 211, 212, 213, 214, 221, 222, 223, 231, 232, 241, 251, 252, 271, 272, 281, 291, 311, 331, 341, 342, 343, 351, 352, 411, 421, 431, 441, 451, 461, 471, 481, 491, 512, 513, 521, 541, 551, 561, 571, 581, 591, 611, 612, 613, 711, 721, 722, 723, 724, 725, 726, 727, 728, 741, 751
WASTE SOLIDS TREATMENT (Maximum Design Capacity: 14,400 Gallons/day) (Tank Storage Capacity: 10,000 Gallons)	D006, D007, D008, D011, 241, 151, 252, 351, 352, 451

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TABLE 3
SOURCE PARAMETERS

Source No.	Source Name	Source ID	UTM Coordinates		Height (m)	Flow Rate (g/s)	Exit Velocity (m/s)	Diameter (m)	Area Dimentions		Angle (deg)	Temperature (K)
			Easting	Northing					Length (m)	Width (m)		
1	Boiler 1	BOILER1	387624	3764680	5.3	1	2.04	0.46				530.4
2	Boiler 2	BOILER2	387628	3764679	5.3	1	2.04	0.46				530.4
3	Oil Heater	OILHTR	387520	3764690	8.8	1	5.16	0.69				477.6
4	Heater 1	H1	387507	3764692	4.11	1	1.95	0.46				530.4
5	Heater 2	H2	387507	3764691	4.11	1	1.95	0.46				530.4
6	Backup Generator	BUGEN	387433	3764698	3.05	1	20	0.1				530.4
7	Loading Rack 1	LOAD1	387489	3764663	2	1			18.01	5.62		
8	Loading Rack 2	LOAD2	387511	3764663	2	1			17.97	5.62		
9	Loading Rack 3	LOAD3	387533	3764663	2	1			18.01	5.62		
10	Loading Rack 4	LOAD4	387556	3764664	2	1			18.01	5.62	-7	
11	Rail Loading 1	RRLOAD1	387592	3764661	1	1			33	8		
12	Rail Loading 2	RRLOAD2	387627	3764661	1	1			33	8		
13	Rail Loading 3	RRLOAD3	387661	3764661	3	1			33	8.25		
14	Solid Waste Drums	DRUMS	387473	3764668	2	1			16.29	22.61		
15	Flammable Waste Drums	DRUMN	387473	3764692	2	1			15.73	5.62		
16	Wastewater Treatment System	WWTS	387499	3764692	2	1			3.93	4.07		
17	Fuel Blending	FUELBLD	387531	3764672	3	1			5.25	5.53		
18	Oil Treatment Tanks	OILTREAT	387510	3764678	6	1			12.98	12.87		
19	Fugitive Area 1	FUG1	387491	3764673	2	1			32.84	20.24		
20	Fugitive Area 2	FUG2	387529	3764673	2	1			26	18	-353.39	
21	Fugitive Area 3	FUG3	387560	3764679	2	1			16.5	7	-350.09	
22	Filter Press	PRESS	387494	3764687	2	1			1.75	3		
23	Dissolved Air Flotation	DAF	387500	3764689	2	1			2.5	2.5		

TABLE 4
CHEMICALS OF POTENTIAL CONCERN HEALTH EFFECTS

COPC	Carcinogen	Noncarcinogen - Chronic	Noncarcinogen - Acute
Acetaldehyde	X	X	--
Acrolein	--	X	X
Acrylonitrile	X	X	--
Ammonia	--	X	X
Aniline	X	X	--
Arsenic	X	X	X
Benzene	X	X	X
Beryllium	X	X	--
Butadiene, 1,3-	X	--	--
Cadmium	X	X	X
Carbon Tetrachloride	X	X	X
Chlorine	--	X	X
Chloroethene (vinyl chloride)	X	X	X
Chloroform	X	X	X
Copper	--	--	X
Dichlorobenzene, 1,4 (dichlorobenzene, p)	X	X	--
Dichloroethane, 1,1	X	--	--
Dichloroethylene, 1,1 (vinylidene chloride)	--	X	--
Dioxane, 1,4	X	X	X
Epichlorohydrin	X	X	X
Ethylbenzene	--	X	--
Ethylene Dibromide	X	X	--
Ethylene Dichloride	X	X	--
Formaldehyde	X	X	X
Hexane	--	X	--
Hexavalent Chromium	--	X	X
Hydrofluoric Acid	--	X	X
Lead	X	--	X
Manganese	--	X	--
Mercury	--	X	X
Methylene Chloride	X	X	X
Naphthalene	X	X	--
Nickel	X	X	X
PAHs[(1)]	X	--	--
Propene	--	X	--
Selenium	--	X	X
Styrene	--	X	X
Tetrachloroethylene	X	X	X
Toluene	--	X	X
Trichloroethane, 1,1,1-	X	--	--
Trichloroethylene	X	X	--
Xylenes (o-, m- & p-)	--	X	X

(1) Modelled as Benzo(a)pyrene.

TABLE 5
AGENCY ESTABLISHED SLOPE FACTORS AND HEALTH EFFECTS THRESHOLDS

CAS No.	COPC	Inhalation Cancer Unit Risk Factor ($\mu g/m^3$)	Inhalation Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$	Oral Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$	Acute REL ($\mu g/m^3$)	Inhalation Chronic REL ($\mu g/m^3$)	Oral Chronic REL (mg/kg/d)
75-34-3	1,1-Dichloroethane	1.60E-06	5.70E-03				
106-99-0	1,3-Butadiene	1.70E-04	6.00E-01			2.00E+01	
123-91-1	1,4-Dioxane	7.70E-06	2.70E-02		3.00E+03	3.00E+03	
75-07-0	Acetaldehyde	2.70E-06	1.00E-02			9.00E+00	
107-02-8	Acrolein				1.90E-01	6.00E-02	
107-13-1	Acrylonitrile	2.90E-04	1.00E+00			5.00E+00	
62-53-3	Aniline	1.60E-06	5.70E-03			1.00E+00	
7440-38-2	Arsenic	3.30E-03	1.20E+01	1.50E+00	1.90E-01	3.00E-02	3.00E-04
71-43-2	Benzene	2.90E-05	1.00E-01		1.30E+03	6.00E+01	
50-32-8	Benzo[a]pyrene	1.10E-03	3.90E+00	1.20E+01			
7440-41-7	Beryllium	2.40E-03	8.40E+00			7.00E-03	2.00E-03
7440-43-9	Cadmium	4.20E-03	1.50E+01			2.00E-02	5.00E-04
56-23-5	Carbon tetrachloride	4.20E-05	1.50E-01		1.90E+03	4.00E+01	
7782-50-5	Chlorine				2.10E+02	2.00E-01	
67-66-3	Chloroform	5.30E-06	1.90E-02		1.50E+02	3.00E+02	
18540-29-9	Chromium, hexavalent (& compounds)	1.50E-01	5.10E+02			2.00E-01	2.00E-02
7440-50-8	Copper				1.00E+02	2.40E+00	
106-89-8	Epichlorohydrin	2.30E-05	8.00E-02		1.30E+03	3.00E+00	
100-41-4	Ethyl benzene					2.00E+03	
106-93-4	Ethylene dibromide {EDB}	7.10E-05	2.50E-01			8.00E-01	
107-06-2	Ethylene dichloride {EDC}	2.10E-05	7.20E-02			4.00E+02	
50-00-0	Formaldehyde	6.00E-06	2.10E-02		9.40E+01	3.00E+00	
7647-01-0	Hydrochloric acid				2.10E+03	9.00E+00	
7439-92-1	Lead	1.20E-05	4.20E-02	8.50E-03			
7439-96-5	Manganese					2.00E-01	
7439-97-6	Mercury				1.80E+00	9.00E-02	3.00E-04
71-55-6	Methyl chloroform {1,1,1-TCA}				6.80E+04	1.00E+03	
75-09-2	Methylene chloride {Dichloromethane}	1.00E-06	3.50E-03		1.40E+04	4.00E+02	
108-38-3	m-Xylene				2.20E+04	7.00E+02	
91-20-3	Naphthalene	3.40E-05	1.20E-01			9.00E+00	
7440-02-0	Nickel	2.60E-04	9.10E-01		6.00E+00	5.00E-02	5.00E-02
106-46-7	p-Dichlorobenzene	1.10E-05	4.00E-02			8.00E+02	
127-18-4	Perchloroethylene {Tetrachloroethene}	5.90E-06	2.10E-02		2.00E+04	3.50E+01	
7782-49-2	Selenium					2.00E+01	
100-42-5	Styrene				2.10E+04	9.00E+02	
108-88-3	Toluene				3.70E+04	3.00E+02	
79-01-6	Trichloroethylene	2.00E-06	7.00E-03			6.00E+02	
75-01-4	Vinyl chloride	7.80E-05	2.70E-01		1.80E+05	2.60E+01	
75-35-4	Vinylidene chloride					7.00E+01	

TABLE 6
CANCER RISK BY CHEMICAL OF POTENTIAL CONCERN
FOR
REASONABLE MAXIMUM EXPOSED RESIDENT

COPC	Cancer Risk	Percent Contribution
Acetaldehyde	8.54E-11	0.01%
Acrolein	0.00E+00	0.00%
Acrylonitrile	1.09E-07	9.36%
Aniline	1.78E-11	0.00%
Arsenic	1.52E-10	0.01%
Benzene	5.66E-07	48.63%
Benzo(a)pyrene	5.37E-09	0.46%
Cadmium	1.77E-10	0.02%
Carbon tetrachloride	4.66E-08	4.00%
Chlorine	0.00E+00	0.00%
Chloroform (Trichloromethane)	3.67E-08	3.15%
Chromium, hexavalent	4.02E-10	0.03%
Dichlorobenzene,1,4-	7.70E-10	0.07%
Dichloroethane 1,1-	1.08E-08	0.93%
Dichloroethane, 1,2- (Ethylene Dichloride)	4.76E-08	4.09%
Dichloroethylene 1,1-	0.00E+00	0.00%
Dioxane, 1,4-	7.80E-09	0.67%
Epichlorohydrin (1-Chloro-2,3- epoxypropane)	1.00E-08	0.86%
Ethylbenzene	0.00E+00	0.00%
Ethylene Dibromide	4.32E-08	3.71%
Formaldehyde	1.25E-07	10.72%
Hydrogen chloride	0.00E+00	0.00%
Lead	2.91E-12	0.00%
Mercury	0.00E+00	0.00%
Methylene chloride	1.33E-08	1.14%
Naphthalene	4.28E-11	0.00%
Nickel	2.79E-11	0.00%
Selenium	0.00E+00	0.00%
Tetrachloroethylene (Perchloroethylene)	9.25E-08	7.94%
Toluene	0.00E+00	0.00%
Trichloroethane, 1,1,1-	0.00E+00	0.00%
Trichloroethylene	6.79E-09	0.58%
Vinyl Chloride	4.20E-08	3.61%
Xylene, m-	0.00E+00	0.00%
Grand Total	1.16E-06	100.00%

TABLE 7
CANCER RISK BY PATHWAY
FOR
REASONABLE MAXIMUM EXPOSED RESIDENT

Pathway	Cancer Risk	Percent Contribution
Soil Ingestion	1.25E-09	0.11%
Produce	3.46E-09	0.30%
Inhalation	1.16E-06	99.60%
Total	1.16E-06	100.00%

TABLE 8
CANCER RISK BY SOURCE
FOR
REASONABLE MAXIMUM EXPOSED RESIDENT

Source	Cancer Risk	Percent Contribution
BOILER1	1.29E-10	0.01%
BOILER2	1.30E-10	0.01%
BUGEN	1.27E-09	0.11%
DAF	3.47E-10	0.03%
DRUMN	3.02E-08	2.59%
DRUMS	3.67E-07	31.56%
FUELBLND	1.33E-07	11.45%
FUG1	6.51E-08	5.59%
FUG2	9.48E-10	0.08%
FUG3	1.23E-10	0.01%
H1	1.99E-10	0.02%
H2	1.98E-10	0.02%
LOAD1	2.58E-09	0.22%
LOAD2	2.49E-09	0.21%
LOAD3	2.40E-09	0.21%
LOAD4	2.34E-09	0.20%
OILHTR	9.99E-10	0.09%
OILTREAT	5.41E-07	46.42%
PRESS	4.77E-09	0.41%
RRLOAD1	6.11E-09	0.52%
RRLOAD2	1.50E-09	0.13%
RRLOAD3	1.29E-09	0.11%
WWTS	4.00E-11	0.00%
Grand Total	1.16E-06	100.00%

TABLE 9
CANCER RISK BY CHEMICAL OF POTENTIAL CONCERN
FOR
UNADJUSTED REASONABLE MAXIMUM EXPOSED WORKER

COPC	Cancer Risk(1)	Percent Contribution
Acetaldehyde	4.97E-10	0.01%
Acrolein	0.00E+00	0.00%
Acrylonitrile	7.13E-07	7.17%
Aniline	1.14E-10	0.00%
Arsenic	3.90E-10	0.00%
Benzene	4.45E-06	44.76%
Benzo(a)pyrene	3.04E-07	3.05%
Cadmium	4.55E-10	0.00%
Carbon tetrachloride	2.98E-07	2.99%
Chlorine	0.00E+00	0.00%
Chloroform (Trichloromethane)	2.36E-07	2.37%
Chromium, hexavalent	1.03E-09	0.01%
Dichlorobenzene,1,4-	4.93E-09	0.05%
Dichloroethane 1,1-	6.92E-08	0.70%
Dichloroethane, 1,2- (Ethylene Dichloride)	3.05E-07	3.07%
Dichloroethylene 1,1-	0.00E+00	0.00%
Dioxane, 1,4-	5.44E-08	0.55%
Epichlorohydrin (1-Chloro-2,3- epoxypropane)	6.47E-08	0.65%
Ethylbenzene	0.00E+00	0.00%
Ethylene Dibromide	2.77E-07	2.78%
Formaldehyde	1.93E-06	19.39%
Hydrogen chloride	0.00E+00	0.00%
Lead	7.59E-12	0.00%
Mercury	0.00E+00	0.00%
Methylene chloride	1.06E-07	1.07%
Naphthalene	3.52E-10	0.00%
Nickel	7.18E-11	0.00%
Selenium	0.00E+00	0.00%
Tetrachloroethylene (Perchloroethylene)	7.43E-07	7.47%
Toluene	0.00E+00	0.00%
Trichloroethane, 1,1,1-	0.00E+00	0.00%
Trichloroethylene	4.62E-08	0.46%
Vinyl Chloride	3.42E-07	3.44%
Xylene, m-	0.00E+00	0.00%
Grand Total	9.95E-06	100.00%

(1) Model output values unadjusted for exposure frequency, valid exposure pathways, soil ingestion contribution, and exposure duration. See Table 10 for RMEW.

TABLE 10
CANCER RISK BY PATHWAY
FOR
REASONABLE MAXIMUM EXPOSED WORKER

Pathway	Residential Cancer Risk Contribution	Percent Contribution	Occupational Cancer Risk Contribution (1)	Percent Contribution
Soil Ingestion	7.27E-08	0.73%	2.16E-08	0.37%
Produce Ingestion	2.01E-07	2.02%	0.00E+00	0.00%
Inhalation	9.67E-06	97.25%	5.76E-06	99.63%
Totals	9.95E-06	100.00%	5.78E-06	100.00%

Residential to Occupational Exposure Conversion Factors	Residential	Worker	Adjustment Factor	Units
Exposure Frequency	350	250	7.14E-01	days/year
Soil Ingestion	0.001	0.0005	5.00E-01	kg/day
Exposure Duration	30	25	8.33E-01	years

(1) Adjusting the residential cancer risk for the changes in exposure frequency, soil ingestion rate, and exposure duration.

TABLE 11
CANCER RISK BY SOURCE
FOR
UNADJUSTED REASONABLE MAXIMUM EXPOSED WORKER

Source	Cancer Risk(1)	Percent Contribution
BOILER1	7.20E-09	0.07%
BOILER2	7.82E-09	0.08%
BUGEN	3.27E-09	0.03%
DAF	2.14E-09	0.02%
DRUMN	1.35E-07	1.36%
DRUMS	2.31E-06	23.26%
FUELBLND	1.77E-06	17.76%
FUG1	5.09E-07	5.12%
FUG2	1.30E-08	0.13%
FUG3	2.63E-09	0.03%
H1	9.68E-10	0.01%
H2	1.06E-09	0.01%
LOAD1	2.52E-08	0.25%
LOAD2	3.25E-08	0.33%
LOAD3	4.37E-08	0.44%
LOAD4	6.01E-08	0.60%
OILHTR	4.82E-09	0.05%
OILTREAT	4.35E-06	43.78%
PRESS	2.90E-08	0.29%
RRLOAD1	4.05E-07	4.07%
RRLOAD2	1.62E-07	1.63%
RRLOAD3	6.63E-08	0.67%
WWTS	2.35E-10	0.00%
Grand Total	9.95E-06	100.00%

(1) Model output values unadjusted for exposure frequency, valid exposure pathways, soil ingestion contribution, and exposure duration. See Table 10 for RMEW.

TABLE 12
SENSITIVE RECEPTOR LOCATIONS AND CALCULATED RISK

Receptor ID	Receptor Name	UTM Coordinates		Adult Cancer	Child Cancer
		Easting	Northing		
IND1	Industrial Receptor(1)	387700	3764700	5.78E-06	
IND2	Industrial Receptor(1)	387900	3764800	1.58E-08	
RES1	Residential Receptor	387770	3764354	1.53E-07	6.82E-08
RES2	Residential Receptor	387996	3765048	1.16E-06	5.19E-07
RES3	Residential Receptor	387760	3765166	1.92E-07	8.57E-08
SEN01	Resurrection Elementary School	388805	3765068	4.09E-07	1.82E-07
SEN02	Estrada Courts Community Center	388409	3764126	2.67E-08	1.19E-08
SEN03	Christopher Dera Elementary School	388220	3765037	9.26E-07	4.13E-07
SEN04	Lou Costello Junior Recreation Center	388263	3764916	1.04E-06	4.66E-07
SEN05	Lorena Street School	388943	3765413	2.72E-07	1.21E-07
SEN06	Euclid Avenue School	388692	3766001	4.15E-08	1.85E-08
SEN07	Sunrise Elementary School	388360	3765889	3.32E-08	1.48E-08
SEN08	Soto Street School	387737	3766106	4.06E-08	1.81E-08
SEN09	Bishop Mora High School	387803	3766203	3.42E-08	1.52E-08
SEN10	Dacotah School	388328	3765020	8.47E-07	3.78E-07
SEN11	Proposed New High School	388784	3765292	3.55E-07	1.58E-07

(1) Adjusting the residential cancer risk for changes in exposure frequency, soil ingestion rate, and exposure duration.

TABLE 13
CANCER RISK BY CHEMICAL OF POTENTIAL CONCERN
FOR
SENSITIVE RECEPTOR

COPC	Adult Cancer Risk	Adult Percent Contribution	Child Cancer Risk	Child Percent Contribution
Acetaldehyde	6.65E-11	0.01%	2.96E-11	0.01%
Acrolein	0.00E+00	0.00%	0.00E+00	0.00%
Acrylonitrile	9.13E-08	8.75%	4.06E-08	8.71%
Aniline	1.48E-11	0.00%	6.60E-12	0.00%
Arsenic	1.05E-10	0.01%	4.65E-11	0.01%
Benzene	5.05E-07	48.34%	2.24E-07	48.15%
Benzo(a)pyrene	8.14E-09	0.78%	5.47E-09	1.17%
Cadmium	1.22E-10	0.01%	5.43E-11	0.01%
Carbon tetrachloride	3.88E-08	3.72%	1.73E-08	3.71%
Chlorine	0.00E+00	0.00%	0.00E+00	0.00%
Chloroform (Trichloromethane)	3.07E-08	2.94%	1.36E-08	2.93%
Chromium, hexavalent	2.77E-10	0.03%	1.23E-10	0.03%
Dichlorobenzene,1,4-	6.43E-10	0.06%	2.86E-10	0.06%
Dichloroethane 1,1-	9.01E-09	0.86%	4.00E-09	0.86%
Dichloroethane, 1,2- (Ethylene Dichloride)	3.97E-08	3.80%	1.77E-08	3.79%
Dichloroethylene 1,1-	0.00E+00	0.00%	0.00E+00	0.00%
Dioxane, 1,4-	6.62E-09	0.63%	2.94E-09	0.63%
Epichlorohydrin (1-Chloro-2,3- epoxypropane)	8.38E-09	0.80%	3.73E-09	0.80%
Ethylbenzene	0.00E+00	0.00%	0.00E+00	0.00%
Ethylene Dibromide	3.61E-08	3.45%	1.60E-08	3.44%
Formaldehyde	1.32E-07	12.62%	5.86E-08	12.57%
Hydrogen chloride	0.00E+00	0.00%	0.00E+00	0.00%
Lead	2.02E-12	0.00%	9.34E-13	0.00%
Mercury	0.00E+00	0.00%	0.00E+00	0.00%
Methylene chloride	1.19E-08	1.14%	5.28E-09	1.13%
Naphthalene	3.69E-11	0.00%	1.64E-11	0.00%
Nickel	1.92E-11	0.00%	8.55E-12	0.00%
Selenium	0.00E+00	0.00%	0.00E+00	0.00%
Tetrachloroethylene (Perchloroethylene)	8.31E-08	7.96%	3.69E-08	7.93%
Toluene	0.00E+00	0.00%	0.00E+00	0.00%
Trichloroethane, 1,1,1-	0.00E+00	0.00%	0.00E+00	0.00%
Trichloroethylene	5.77E-09	0.55%	2.57E-09	0.55%
Vinyl Chloride	3.69E-08	3.53%	1.64E-08	3.52%
Xylene, m-	0.00E+00	0.00%	0.00E+00	0.00%
Grand Total	1.04E-06	100.00%	4.66E-07	100.00%

TABLE 14
CANCER RISK BY PATHWAY
FOR
SENSITIVE RECEPTOR

Adult

Pathway	Cancer Risk	Percent Contribution
Soil Ingestion	1.19E-09	0.11%
Produce	5.30E-09	0.51%
Inhalation	1.04E-06	99.38%
Total	1.04E-06	100.00%

Child

Pathway	Cancer Risk	Percent Contribution
Soil Ingestion	3.58E-09	0.77%
Produce	1.48E-09	0.32%
Inhalation	4.61E-07	98.91%
Total	4.66E-07	100.00%

TABLE 15
CANCER RISK BY SOURCE
FOR
SENSITIVE RECEPTOR

Source	Adult Cancer Risk	Percent Contribution	Child Cancer Risk	Percent Contribution
BOILER1	2.01E-10	0.02%	1.09E-10	0.02%
BOILER2	2.12E-10	0.02%	1.15E-10	0.02%
BUGEN	8.78E-10	0.08%	3.90E-10	0.08%
DAF	2.90E-10	0.03%	1.29E-10	0.03%
DRUMN	2.27E-08	2.17%	1.01E-08	2.17%
DRUMS	3.07E-07	29.36%	1.36E-07	29.24%
FUELBLND	1.36E-07	13.02%	6.04E-08	12.96%
FUG1	5.71E-08	5.46%	2.54E-08	5.44%
FUG2	9.64E-10	0.09%	4.28E-10	0.09%
FUG3	1.39E-10	0.01%	6.19E-11	0.01%
H1	1.55E-10	0.01%	8.44E-11	0.02%
H2	1.66E-10	0.02%	9.04E-11	0.02%
LOAD1	2.47E-09	0.24%	1.10E-09	0.24%
LOAD2	2.59E-09	0.25%	1.15E-09	0.25%
LOAD3	2.74E-09	0.26%	1.22E-09	0.26%
LOAD4	2.90E-09	0.28%	1.29E-09	0.28%
OILHTR	9.27E-10	0.09%	5.17E-10	0.11%
OILTREAT	4.87E-07	46.64%	2.16E-07	46.45%
PRESS	3.95E-09	0.38%	1.76E-09	0.38%
RRLOAD1	9.95E-09	0.95%	6.10E-09	1.31%
RRLOAD2	3.05E-09	0.29%	1.35E-09	0.29%
RRLOAD3	3.35E-09	0.32%	1.49E-09	0.32%
WWTS	3.23E-11	0.00%	1.44E-11	0.00%
Grand Total	1.04E-06	100.00%	4.66E-07	100.00%

TABLE 16
MAXIMUM CHRONIC HAZARD QUOTIENT
BY
CHEMICAL OF POTENTIAL CONCERN AND SOURCE

Sum of Adjusted Quotient	SOURCE																							
COPC	**BOILER1**	**BOILER2**	**BUGEN**	**DAF**	**DRUMN**	**DRUMS**	**FUELBLND**	**FUG1**	**FUG2**	**FUG3**	**H1**	**H2**	**LOAD1**	**LOAD2**	**LOAD3**	**LOAD4**	**OILHTR**	**OILTREAT**	**PRESS**	**RRLOAD1**	**RRLOAD2**	**RRLOAD3**	**WWTS**	**Grand Total**
Acetaldehyde	1.17E-03	1.27E-03	1.59E-03								1.56E-04	1.71E-04					6.35E-04							**5.00E-03**
Acrolein	2.99E-03	3.24E-03	2.80E-04								3.99E-04	4.36E-04					2.24E-03							**9.59E-03**
Acrylonitrile					1.46E-04	2.50E-03	1.97E-04						1.42E-06	1.83E-06	2.46E-06	3.38E-06				6.36E-06	8.97E-06	3.66E-06		**2.87E-03**
Aniline					1.09E-05	1.87E-04	1.57E-05						1.29E-08	1.66E-08	2.23E-08	3.07E-08				5.76E-08	8.12E-08	3.32E-08		**2.14E-04**
Arsenic			9.16E-06																					**9.16E-06**
Benzene	2.96E-06	3.22E-06	5.15E-07	2.22E-06	2.74E-05	4.70E-04	3.93E-05	5.79E-04	1.39E-05	2.85E-06	3.96E-07	4.34E-07	2.99E-09	3.86E-09	5.19E-09	7.14E-09	1.61E-06	4.91E-03	3.01E-05	1.34E-08	3.49E-06	1.43E-06	2.74E-07	**6.09E-03**
Benzo(a)pyrene	0.00E+00	0.00E+00									0.00E+00	0.00E+00					0.00E+00			0.00E+00				**0.00E+00**
Cadmium			1.77E-05																					**1.77E-05**
Carbon tetrachloride					3.40E-04	5.83E-03	4.50E-04						1.97E-08	2.54E-08	3.42E-08	4.70E-08				8.82E-08	1.24E-07	5.08E-08		**6.62E-03**
Chlorine					5.49E-06	9.42E-05																		**9.97E-05**
Chloroform					1.48E-04	2.54E-03	2.13E-04						3.24E-08	4.18E-08	5.62E-08	7.73E-08				1.45E-07	2.04E-07	8.33E-08		**2.91E-03**
Chromium, hexavalent			9.96E-10																					**9.96E-10**
Dichlorobenzene,1,4-					8.91E-08	1.53E-06	1.28E-07						1.48E-13	1.91E-13	2.57E-13	3.53E-13				6.61E-13	9.32E-13	3.81E-13		**1.75E-06**
Dichloroethane 1,1-					1.01E-05	1.74E-04	1.46E-05						2.07E-09	2.67E-09	3.59E-09	4.94E-09				9.27E-09	1.31E-08	5.34E-09		**1.99E-04**
Dichloroethane, 1,2-					1.75E-04	3.01E-03	2.53E-04						5.95E-08	7.69E-08	1.03E-07	1.42E-07				2.66E-07	3.76E-07	1.54E-07		**3.44E-03**
Dichloroethylene 1,1-					4.27E-04	7.33E-03	6.15E-04						5.23E-08	6.76E-08	9.08E-08	1.25E-07				2.34E-07	3.30E-07	1.35E-07		**8.37E-03**
Dioxane, 1,4-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Epichlorohydrin					3.43E-04	5.89E-03	4.94E-04						8.79E-07	1.14E-06	1.53E-06	2.10E-06				3.92E-06	5.53E-06	2.26E-06		**6.74E-03**
Ethylbenzene	2.14E-07	2.32E-07	1.83E-09	7.84E-08	2.18E-07	3.74E-06	3.13E-07	1.57E-05	5.37E-07	1.09E-07	2.85E-08	3.12E-08	2.93E-12	3.79E-12	5.09E-12	7.01E-12	1.16E-07	1.41E-04	1.06E-06	1.31E-11	8.59E-08	3.51E-08	6.78E-09	**1.63E-04**
Ethylene Dibromide					2.53E-03	4.34E-02	3.63E-03						1.12E-07	1.45E-07	1.95E-07	2.68E-07				5.03E-07	7.09E-07	2.90E-07		**4.95E-02**
Formaldehyde	1.26E-04	1.37E-04	9.53E-05		5.43E-05	9.32E-04	9.54E-03				1.68E-05	1.84E-05	3.02E-03	3.90E-03	5.25E-03	7.22E-03	6.83E-05			1.36E-02	1.91E-02	7.81E-03		**7.09E-02**
Hydrogen chloride			1.55E-06																					**1.55E-06**
Lead			0.00E+00																					**0.00E+00**
Mercury			3.67E-06																					**3.67E-06**
Methylene chloride				6.04E-08				1.57E-05	5.95E-07	1.24E-07			3.59E-12	4.64E-12	6.23E-12	8.57E-12		6.88E-05	8.19E-07	1.61E-11	1.74E-07	7.11E-08	1.37E-08	**8.64E-05**
Naphthalene	7.09E-08	7.70E-08	3.48E-08								9.48E-09	1.04E-08					5.33E-08							**2.56E-07**
Nickel			1.37E-05																					**1.37E-05**
Selenium			2.14E-08																					**2.14E-08**
Tetrachloroethylene				4.80E-06				7.17E-04	2.21E-05	4.33E-06			4.81E-11	6.21E-11	8.35E-11	1.15E-10		7.45E-03	6.46E-05	2.15E-10	2.35E-06	9.58E-07	1.84E-07	**8.27E-03**
Toluene	2.03E-06	2.20E-06	4.36E-08	2.38E-06	6.68E-05	1.15E-03	1.05E-04	3.99E-04	1.60E-05	3.25E-06	2.71E-07	2.96E-07	8.67E-08	1.12E-07	1.51E-07	2.07E-07	1.10E-06	1.99E-03	3.22E-05	3.88E-07	3.76E-06	1.54E-06	2.53E-07	**3.77E-03**
Trichloroethane, 1,1,1-				1.72E-07				2.63E-05	7.32E-07	1.43E-07			1.76E-12	2.27E-12	3.05E-12	4.20E-12		2.94E-04	2.32E-06	7.87E-12	8.56E-08	3.50E-08	6.75E-09	**3.23E-04**
Trichloroethylene				7.91E-07	9.35E-05	1.60E-03	1.35E-04	1.17E-04	1.85E-06	3.71E-07			2.32E-09	3.00E-09	4.03E-09	5.54E-09		6.09E-04	1.07E-05	1.04E-08	6.87E-07	2.80E-07	5.29E-08	**2.57E-03**
Vinyl Chloride					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Xylene, m-	8.68E-08	9.42E-08	1.01E-09	5.49E-08	2.08E-08	3.56E-07	2.99E-08	1.21E-05	4.89E-07	9.99E-08	1.16E-08	1.27E-08	1.98E-12	2.55E-12	3.43E-12	4.72E-12	4.72E-08	8.02E-05	7.42E-07	8.84E-12	9.08E-08	3.71E-08	7.15E-09	**9.45E-05**
Grand Total	**4.29E-03**	**4.66E-03**	**2.01E-03**	**1.06E-05**	**4.37E-03**	**7.51E-02**	**1.57E-02**	**1.88E-03**	**5.62E-05**	**1.13E-05**	**5.73E-04**	**6.27E-04**	**3.02E-03**	**3.91E-03**	**5.25E-03**	**7.22E-03**	**2.95E-03**	**1.55E-02**	**1.43E-04**	**1.36E-02**	**1.92E-02**	**7.82E-03**	**7.98E-07**	**1.88E-01**

TABLE 17
MAXIMUM ACUTE HAZARD QUOTIENT
BY
CHEMICAL OF POTENTIAL CONCERN AND SOURCE

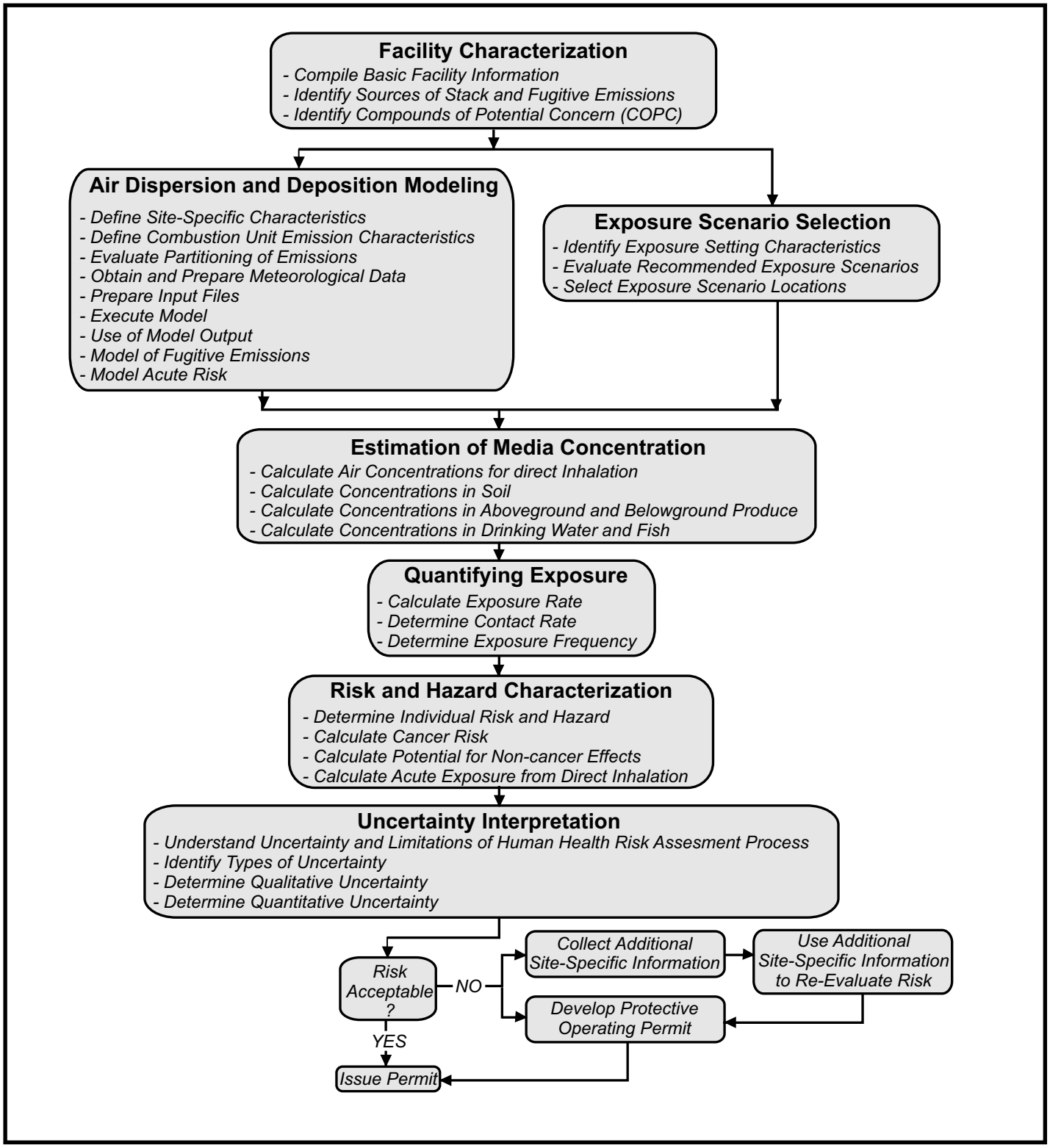
Sum of Adjusted Quotient	SOURCE																							
COPC	**BOILER1**	**BOILER2**	**BUGEN**	**DAF**	**DRUMN**	**DRUMS**	**FUELBLND**	**FUG1**	**FUG2**	**FUG3**	**H1**	**H2**	**LOAD1**	**LOAD2**	**LOAD3**	**LOAD4**	**OILHTR**	**OILTREAT**	**PRESS**	**RRLOAD1**	**RRLOAD2**	**RRLOAD3**	**WWTS**	**Grand Total**
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00					0.00E+00							**0.00E+00**
Acrolein	3.00E-06	2.81E-06	1.01E-06								1.36E-06	1.35E-06					3.37E-06							**1.29E-05**
Acrylonitrile					6.29E-07	8.08E-06	7.84E-07						3.82E-09	4.79E-09	5.92E-09	7.90E-09				1.30E-08	3.02E-08	1.97E-08		**9.58E-06**
Aniline					1.30E-08	1.66E-07	1.26E-08						9.51E-12	1.19E-11	1.47E-11	1.97E-11				3.22E-11	7.50E-11	4.90E-11		**1.92E-07**
Arsenic			3.66E-07																					**3.66E-07**
Benzene	1.27E-08	1.19E-08	7.98E-09	3.37E-08	4.86E-07	6.24E-06	4.52E-07	7.81E-06	1.63E-07	3.19E-08	5.78E-09	5.72E-09	3.31E-11	4.15E-11	5.13E-11	6.85E-11	1.04E-08	6.57E-05	4.54E-07	1.12E-10	4.83E-08	3.15E-08	4.41E-09	**8.15E-05**
Benzo(a)pyrene	2.54E-08	2.38E-08									1.15E-08	1.14E-08					2.87E-08			1.26E-06				**1.36E-06**
Cadmium			3.44E-07																					**3.44E-07**
Carbon tetrachloride					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Chlorine					0.00E+00	0.00E+00																		**0.00E+00**
Chloroform					6.89E-04	8.85E-03	6.46E-04						9.39E-08	1.18E-07	1.45E-07	1.94E-07				3.18E-07	7.39E-07	4.83E-07		**1.02E-02**
Chromium, hexavalent			0.00E+00																					**0.00E+00**
Dichlorobenzene,1,4-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Dichloroethane 1,1-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Dichloroethane, 1,2-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Dichloroethylene 1,1-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Dioxane, 1,4-					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Epichlorohydrin					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	**0.00E+00**
Ethylene Dibromide					9.49E-08	1.22E-06	8.83E-08						2.63E-12	3.30E-12	4.08E-12	5.45E-12				8.92E-12	2.08E-11	1.36E-11		**1.40E-06**
Formaldehyde	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Hydrogen chloride			0.00E+00																					**0.00E+00**
Lead			1.49E-06																					**1.49E-06**
Mercury			1.86E-07																					**1.86E-07**
Methylene chloride				0.00E+00				0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	**0.00E+00**
Naphthalene	9.71E-10	9.11E-10	1.72E-09								4.41E-10	4.37E-10					1.09E-09							**5.57E-09**
Nickel			1.71E-05																					**1.71E-05**
Selenium			5.13E-06																					**5.13E-06**
Tetrachloroethylene				0.00E+00				0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	**0.00E+00**
Toluene	4.96E-08	4.65E-08	3.84E-09	2.05E-07	6.74E-06	8.66E-05	7.20E-06	3.06E-05	1.06E-06	2.07E-07	2.25E-08	2.23E-08	5.46E-09	6.84E-09	8.46E-09	1.13E-08	4.03E-08	1.52E-04	2.77E-06	1.85E-08	2.96E-07	1.93E-07	2.32E-08	**2.88E-04**
Trichloroethane, 1,1,1-				0.00E+00				0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	**0.00E+00**
Trichloroethylene				1.25E-09	1.73E-07	2.23E-06	1.62E-07	1.64E-07	2.26E-09	4.34E-10			2.68E-12	3.36E-12	4.16E-12	5.55E-12		8.52E-07	1.69E-08	9.10E-12	9.91E-10	6.48E-10	8.91E-11	**3.60E-06**
Vinyl Chloride					0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		**0.00E+00**
Xylene, m-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	**0.00E+00**
Grand Total	**3.09E-06**	**2.90E-06**	**2.57E-05**	**2.40E-07**	**6.97E-04**	**8.96E-03**	**6.54E-04**	**3.86E-05**	**1.23E-06**	**2.40E-07**	**1.40E-06**	**1.39E-06**	**1.03E-07**	**1.29E-07**	**1.60E-07**	**2.13E-07**	**3.45E-06**	**2.18E-04**	**3.24E-06**	**1.61E-06**	**1.11E-06**	**7.28E-07**	**2.77E-08**	**1.06E-02**

TABLE 18
SUMMARY OF UNCERTAINTY FOR THE HEALTH RISK ASSESSMENT

Assumption	Effect on Exposure[1]		
	Potential Magnitude for Over Estimation	Potential Magnitude for Under Estimation	Potential Magnitude for Over or Under Estimation
Emission Estimates			
Fugitive emissions estimation formula for truck travel			Medium
Speciation of COPCs			Low
Air Dispersion and Deposition Modeling			
Emissions are assumed continuous	Moderate		
Variations in meteorological data	Low		
Varying degrees of atmospheric turbulence			Low
Use of Gausian dispersion model			Low
Exposure Assessment			
Assumptions regarding land use			Low
Appropriateness of exposure pathways		Low	
Amount of air inhaled is assumed to be constant and representative of the exposed population	Moderate		
Lack of information on indoor air concentration	Moderate		
Standard assumptions regarding body weight, exposure period, life expectancy, population characteristics, and lifestyle may not be representative of any actual exposure period			Moderate
Uncertainty associated with certain environmental parameters (e.g., interception fraction)			Moderate
Toxicity Data			
Lack of conclusive human health effects data			High
Uncertainties in interspecies extrapolation from high dose studies in animals to low dose exposure in humans			High
Uncertainties in the applicability of animal studies on human.			High
Lack of knowledge simultaneous exposure to multiple COPCs			Moderate
Lack of absorption efficiencies data			Moderate to High
Lack of information on health effects specific to each pathway			Moderate

(1) Low - May affect estimates by less than one order of magnitude. Moderate - May affect estimates between one and two orders of magnitude. High - May affect estimates by more than two orders of magnitude.

FIGURES



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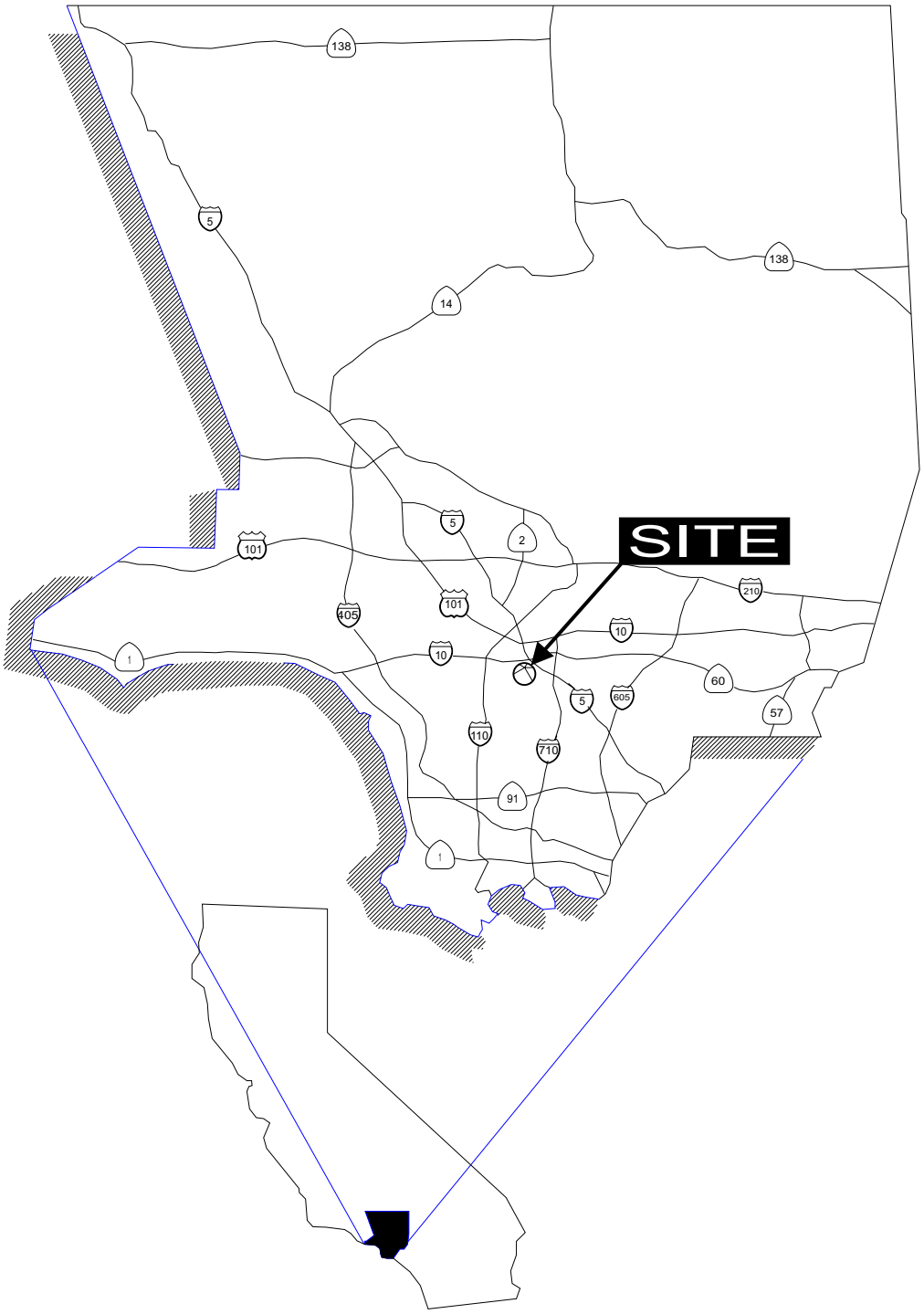
HUMAN HEALTH RISK ASSESSMENT PROCESS

Project No. 1631

Figure 1

N:\1631\HRA\Human Health Risk Flow Chart.cdr



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NOT TO SCALE

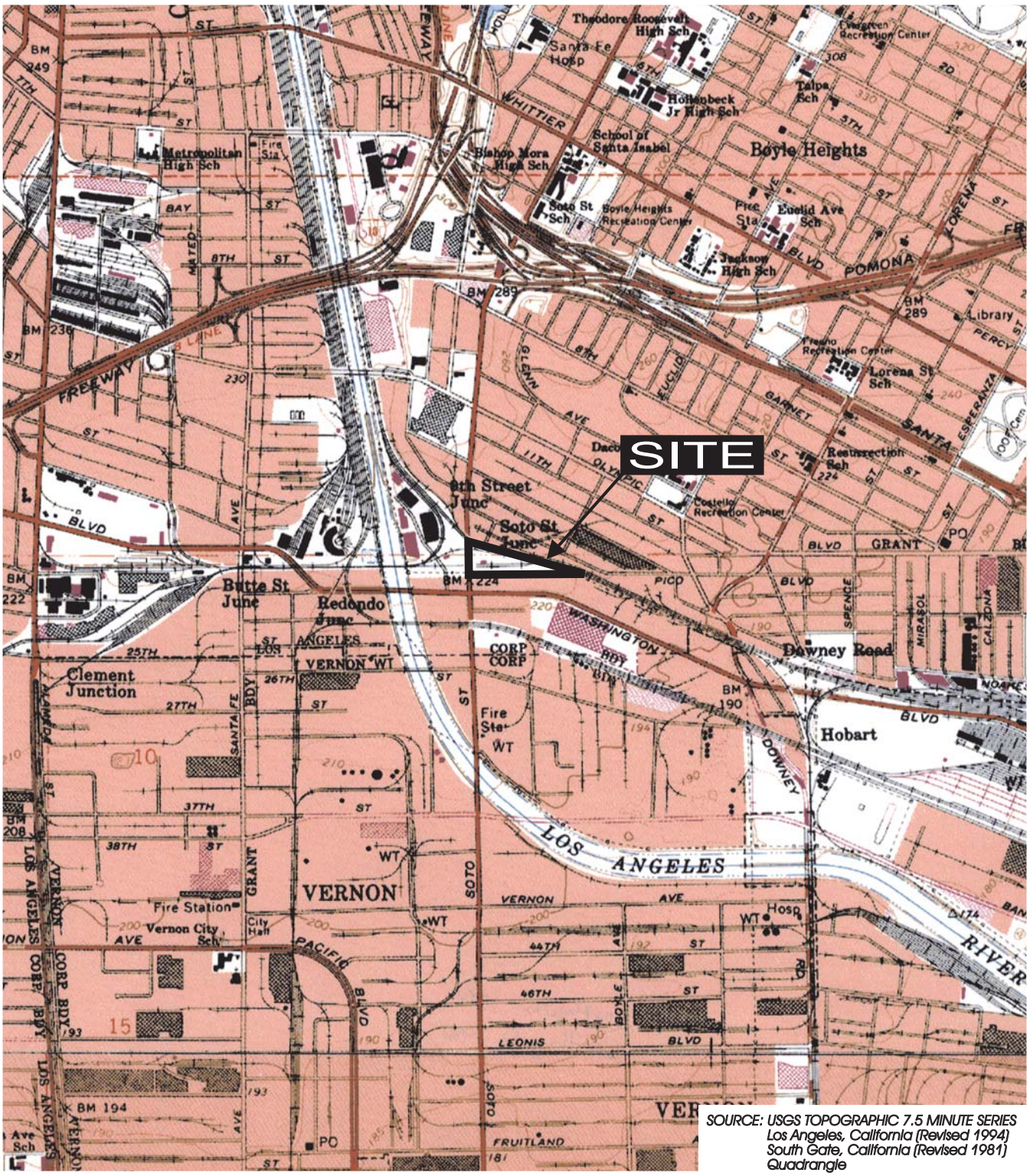
N

REGIONAL LOCATION MAP
INDUSTRIAL SERVICE OIL COMPANY, INC.
1700 South Soto Street
Los Angeles, California

Project No. 1631

Figure 2

N:\1631\HRA\Regional Location Map.cdr



SOURCE: USGS TOPOGRAPHIC 7.5 MINUTE SERIES
Los Angeles, California (Revised 1994)
South Gate, California (Revised 1981)
Quadrangle

Environmental Audit, Inc.

0 2,000'

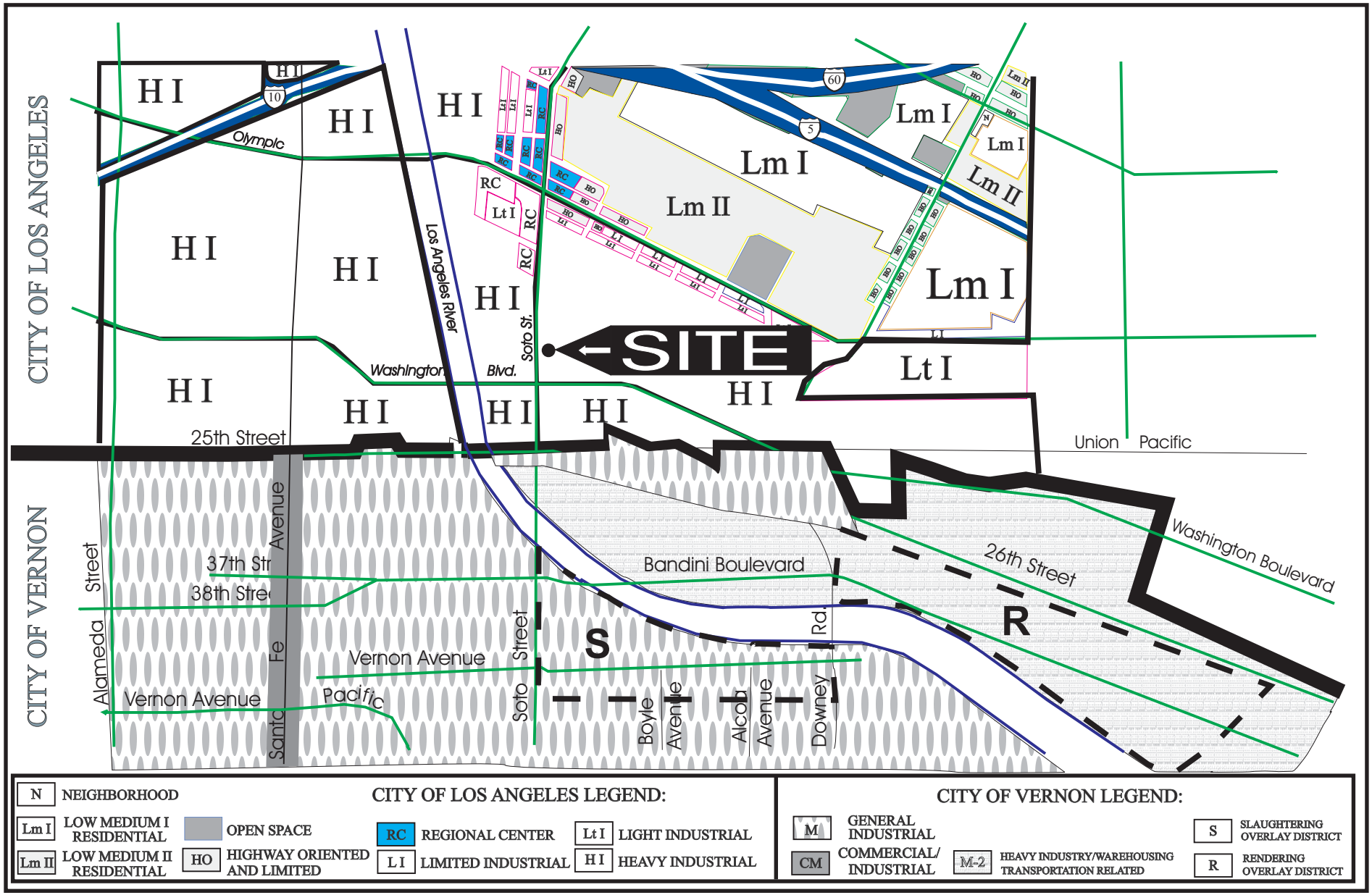
N

SITE LOCATION MAP
INDUSTRIAL SERVICE OIL COMPANY, INC.
1700 South Soto Street
Los Angeles, California

Project No. 1631

Figure 3

N:\1631\HRA\Site Location Map.cdr



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LAND USE MAP
ISOCI
1700 South Soto Street
Los Angeles, CA

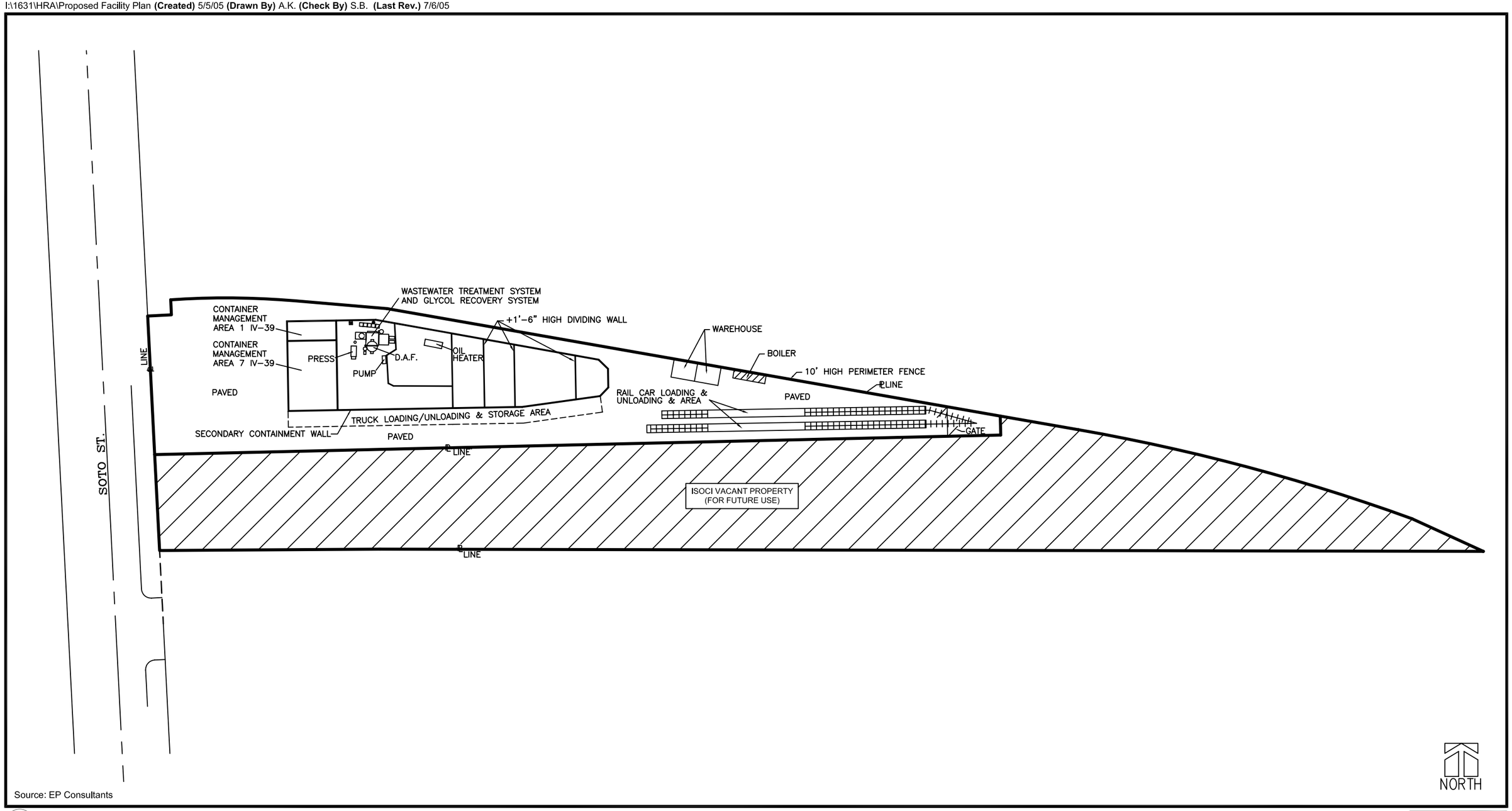
N

Project No. 1631

Figure 4

N:\1631\HRA\Land Use Map ISOCI.cdr

I:\1631\HRA\Proposed Facility Plan **(Created)** 5/5/05 **(Drawn By)** A.K. **(Check By)** S.B. **(Last Rev.)** 7/6/05



Source: EP Consultants

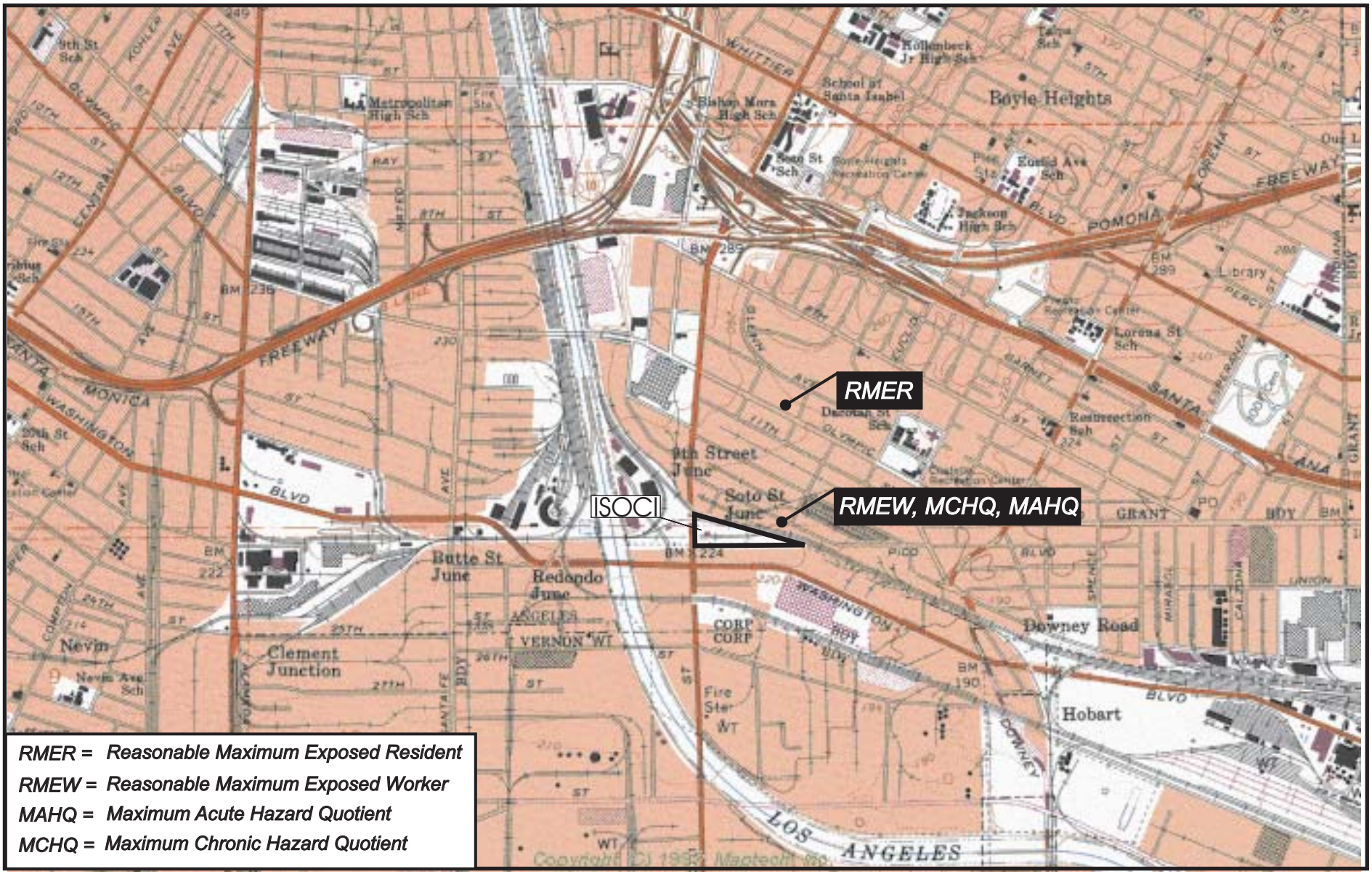
Environmental Audit, Inc.

0 100'

PROPOSED FACILITY PLAN
INDUSTRIAL SERVICE OIL COMPANY, INC.
1700 South Soto Street
Los Angeles, California

Project No. 1631

Figure 5



RMER = Reasonable Maximum Exposed Resident
RMEW = Reasonable Maximum Exposed Worker
MAHQ = Maximum Acute Hazard Quotient
MCHQ = Maximum Chronic Hazard Quotient

ENVIRONMENTAL AUDIT, INC.®

MAXIMUM IMPACT LOCATIONS
INDUSTRIAL SERVICE OIL COMPANY, INC

Project No. 1631

Figure 6

N:\1631\HRA\Maximum Impact Locations (rev.1).cdr

ENVIRONMENTAL AUDIT, INC.®

MODELED RECEPTOR LOCATIONS
INDUSTRIAL SERVICE OIL COMPANY, INC

Project No. 1631

Figure 7

N:\1631\HRA\Modeled Receptor Locations Map.cdr

APPENDIX A

Source Emission Rates

SPECIATION OF COMBUSTION SOURCES

Source	Benzene	1,3-Butadiene	Cadmium	Formaldehyde	Cr(IV)	Arsenic	Lead	Nickel	Naphthalene	PAHs	Acetakdehyde	Acrolein	Copper	Ethyl Benzene	Hexane	Hydrogen Chloride	Manganese	Mercury	Selenium	Toluene	Xylenes
BOILER1																					
Boiler #1	1.37E-01	N/A	N/A	2.91E-01	N/A	N/A	N/A	N/A	5.14E-03	1.71E-03	7.37E-02	4.63E-02	N/A	1.63E-01	1.08E-01	N/A	N/A	N/A	N/A	6.27E-01	4.66E-01
BOILER2																					
Boiler #2	1.37E-01	N/A	N/A	2.91E-01	N/A	N/A	N/A	N/A	5.14E-03	1.71E-03	7.37E-02	4.63E-02	N/A	1.63E-01	1.08E-01	N/A	N/A	N/A	N/A	6.27E-01	4.66E-01
H1																					
Heater 1	1.32E-01	N/A	N/A	2.80E-01	N/A	N/A	N/A	N/A	4.95E-03	1.65E-03	7.09E-02	4.45E-02	N/A	1.57E-01	1.04E-01	N/A	N/A	N/A	N/A	6.04E-01	4.49E-01
H2																					
Heater 2	1.32E-01	N/A	N/A	2.80E-01	N/A	N/A	N/A	N/A	4.95E-03	1.65E-03	7.09E-02	4.45E-02	N/A	1.57E-01	1.04E-01	N/A	N/A	N/A	N/A	6.04E-01	4.49E-01
OILHTR																					
Oil Heater	6.28E-01	N/A	N/A	1.33E+00	N/A	N/A	N/A	N/A	3.25E-02	1.08E-02	3.35E-01	2.92E-01	N/A	7.47E-01	4.98E-01	N/A	N/A	N/A	N/A	2.87E+00	2.13E+00
BUGEN																					
Backup Generator	3.26E-01	3.80E-01	2.63E-03	3.02E+00	1.75E-04	2.80E-03	1.45E-02	6.83E-03	3.45E-02	6.34E-02	1.37E+00	5.93E-02	7.18E-03	1.91E-02	4.71E-02	3.26E-01	5.43E-03	3.50E-03	3.85E-03	1.84E-01	7.42E-02

SPECIATION OF AREA SOURCES IN POUNDS PER YEAR

Source	Total VOC	Speciation	% Contribution to Speciation	Benzene	Butane	Butane, iso-	Ethane	Ethylbenzene	Ethylene	Heptane	Heptane, iso-	Hexane	Hexane, iso-	Methane	Methyl-tert-Butylether (MTBE)	Methylene Chloride	Pentane	Pentane, iso-	Propane	Propene	Tetrachloroethylene	Toluene	Trichloroethane, 1,1,1-	Trichloroethylene	Xylenes (o-, m- & p-)	Acrylonitrile	Aniline	Carbon Tetrachloride	Chlorine	Chloroethene (1,1,1-TCA and vinyl chloride)	Chloroform	Dichlorobenzene, 1,4 (dichlorobenzene, p)	Dichloroethane, 1,1	Dichloroethylene, 1,1 (vinylidene chloride)	Dimethylhydrazine, 1,1 (UDMH)	Dioxane, 1,4	Epichlorohydrin	Ethylene Dibromide
Weight Fractions																																						
Vapor Speciation 1		V1		9.14E-03	9.19E-02	1.89E-02	2.60E-03	5.29E-03	6.07E-04	8.69E-03	1.04E-01	6.91E-02	1.94E-01	6.24E-03	1.41E-01	1.20E-02	6.88E-02	1.49E-01	1.24E-02	9.12E-04	1.15E-02	6.53E-02	1.45E-03	1.14E-03	2.62E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 2		V2		7.98E-03	6.76E-02	9.72E-03	1.00E-04	3.76E-03	4.68E-05	1.01E-02	1.18E-01	5.69E-02	2.87E-01	1.76E-04	1.18E-01	5.39E-03	7.19E-02	1.97E-01	5.45E-04	2.39E-04	7.09E-03	2.16E-02	9.76E-04	3.47E-04	1.51E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 3		V3		1.54E-02	3.62E-02	3.81E-03	9.83E-04	1.22E-02	9.17E-04	1.64E-02	2.00E-01	5.93E-02	2.26E-01	5.24E-04	5.20E-03	2.00E-02	5.20E-02	1.28E-01	1.44E-03	1.38E-03	2.66E-02	1.29E-01	3.06E-03	1.03E-03	6.02E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 6		V6		2.29E-02	N/A	N/A	N/A	2.99E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.08E-01	N/A	2.74E-02	2.01E-03	3.69E-03	1.16E-04	1.07E-02	N/A	4.34E-03	7.22E-02	7.20E-04	7.07E-02	1.88E-01	2.51E-03	1.01E-02	4.66E-03	6.46E-03
Liquid Speciation 1		L1		1.12E-06	N/A	N/A	N/A	4.56E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.70E-06	N/A	N/A	N/A	N/A	4.41E-07	6.90E-06	5.63E-08	7.57E-08	3.39E-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 2		L2		6.33E-05	N/A	N/A	N/A	2.10E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.90E-05	N/A	N/A	N/A	N/A	1.76E-05	1.48E-04	2.47E-06	1.50E-06	1.27E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 3		L3		1.24E-06	N/A	N/A	N/A	6.93E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.00E-06	N/A	N/A	N/A	N/A	6.75E-07	9.05E-06	7.89E-08	4.54E-08	5.14E-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 6		L6		9.50E-07	N/A	N/A	N/A	6.22E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.88E-04	N/A	2.63E-07	4.23E-09	1.53E-05	5.34E-08	2.63E-07	N/A	2.49E-04	6.15E-06	4.66E-10	5.62E-06	8.98E-06	6.69E-05	1.48E-04	4.66E-06	1.12E-07
Speciation Drums		Drums		2.17E-02	N/A	N/A	N/A	2.84E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.54E-01	N/A	2.60E-02	1.91E-03	3.80E-03	1.10E-04	1.10E-02	2.54E-02	4.48E-03	6.84E-02	6.82E-04	6.70E-02	1.79E-01	2.38E-03	9.61E-03	4.42E-03	6.12E-03
LOAD(1-4) x 4																																						
Loading Racks	1.20E-01	L1	100.00%	1.34E-07	N/A	N/A	N/A	5.45E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.23E-07	N/A	N/A	N/A	N/A	5.27E-08	8.24E-07	6.73E-09	9.05E-09	4.05E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Racks	5.75E+00	L6	100.00%	5.46E-06	N/A	N/A	N/A	3.57E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.08E-03	N/A	1.51E-06	2.43E-08	8.78E-05	3.07E-07	1.51E-06	N/A	1.43E-03	3.53E-05	2.68E-09	3.23E-05	5.16E-05	3.84E-04	8.52E-04	2.68E-05	6.43E-07
Truck Idling	2.05E+00	N/A	25.00%	2.55E-03	N/A	N/A	N/A	1.49E-04	N/A	N/A	N/A	3.68E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.44E-03	N/A	N/A	5.80E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**2.55E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.49E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**3.68E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**3.23E-07**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**5.27E-08**	**2.53E-03**	**6.73E-09**	**1.52E-06**	**5.80E-04**	**8.78E-05**	**3.07E-07**	**1.51E-06**	**0.00E+00**	**1.43E-03**	**3.53E-05**	**2.68E-09**	**3.23E-05**	**5.16E-05**	**3.84E-04**	**8.52E-04**	**2.68E-05**	**6.43E-07**
RRLOAD1																																						
Loading Rack	1.20E-01	L1	33.33%	4.45E-08	N/A	N/A	N/A	1.82E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.08E-07	N/A	N/A	N/A	N/A	1.76E-08	2.75E-07	2.24E-09	3.02E-09	1.35E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	1.82E-06	N/A	N/A	N/A	1.19E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.61E-04	N/A	5.05E-07	8.09E-09	2.93E-05	1.02E-07	5.03E-07	N/A	4.78E-04	1.18E-05	8.92E-10	1.08E-05	1.72E-05	1.28E-04	2.84E-04	8.92E-06	2.14E-07
Subtotal				**1.86E-06**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**3.01E-08**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.08E-07**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.76E-08**	**3.61E-04**	**2.24E-09**	**5.08E-07**	**1.43E-07**	**2.93E-05**	**1.02E-07**	**5.03E-07**	**0.00E+00**	**4.78E-04**	**1.18E-05**	**8.92E-10**	**1.08E-05**	**1.72E-05**	**1.28E-04**	**2.84E-04**	**8.92E-06**	**2.14E-07**
RRLOAD2																																						
Loading Rack	1.20E-01	L1	33.33%	4.45E-08	N/A	N/A	N/A	1.82E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.08E-07	N/A	N/A	N/A	N/A	1.76E-08	2.75E-07	2.24E-09	3.02E-09	1.35E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	1.82E-06	N/A	N/A	N/A	1.19E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.61E-04	N/A	5.05E-07	8.09E-09	2.93E-05	1.02E-07	5.03E-07	N/A	4.78E-04	1.18E-05	8.92E-10	1.08E-05	1.72E-05	1.28E-04	2.84E-04	8.92E-06	2.14E-07
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L1	25.00%	3.43E-04	N/A	N/A	N/A	1.40E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	N/A	N/A	N/A	N/A	1.35E-04	2.12E-03	1.73E-05	2.33E-05	1.04E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**3.45E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.40E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**8.31E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.35E-04**	**2.48E-03**	**1.73E-05**	**2.38E-05**	**1.04E-03**	**2.93E-05**	**1.02E-07**	**5.03E-07**	**0.00E+00**	**4.78E-04**	**1.18E-05**	**8.92E-10**	**1.08E-05**	**1.72E-05**	**1.28E-04**	**2.84E-04**	**8.92E-06**	**2.14E-07**
RRLOAD3																																						
Loading Rack	1.20E-01	L1	33.33%	4.45E-08	N/A	N/A	N/A	1.82E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.08E-07	N/A	N/A	N/A	N/A	1.76E-08	2.75E-07	2.24E-09	3.02E-09	1.35E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	1.82E-06	N/A	N/A	N/A	1.19E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.61E-04	N/A	5.05E-07	8.09E-09	2.93E-05	1.02E-07	5.03E-07	N/A	4.78E-04	1.18E-05	8.92E-10	1.08E-05	1.72E-05	1.28E-04	2.84E-04	8.92E-06	2.14E-07
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L1	25.00%	3.43E-04	N/A	N/A	N/A	1.40E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	N/A	N/A	N/A	N/A	1.35E-04	2.12E-03	1.73E-05	2.33E-05	1.04E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rail Idling	2.87E-02	N/A	100.00%	1.70E-01	N/A	N/A	N/A	1.05E-05	N/A	N/A	N/A	2.88E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-05	N/A	N/A	2.51E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**1.71E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.50E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.88E-05**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**8.31E-04**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.35E-04**	**2.50E-03**	**1.73E-05**	**2.38E-05**	**1.07E-03**	**2.93E-05**	**1.02E-07**	**5.03E-07**	**0.00E+00**	**4.78E-04**	**1.18E-05**	**8.92E-10**	**1.08E-05**	**1.72E-05**	**1.28E-04**	**2.84E-04**	**8.92E-06**	**2.14E-07**
DRUMN																																						
Drums	2.05E+01	Drums	23.81%	1.06E-01	N/A	N/A	N/A	1.38E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.73E+00	N/A	1.27E-01	9.31E-03	1.85E-02	5.38E-04	5.37E-02	1.24E-01	2.18E-02	3.34E-01	3.33E-03	3.27E-01	8.70E-01	1.16E-02	4.68E-02	2.15E-02	2.98E-02
Subtotal				**1.06E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.38E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.73E+00**	**0.00E+00**	**1.27E-01**	**9.31E-03**	**1.85E-02**	**5.38E-04**	**5.37E-02**	**1.24E-01**	**2.18E-02**	**3.34E-01**	**3.33E-03**	**3.27E-01**	**8.70E-01**	**1.16E-02**	**4.68E-02**	**2.15E-02**	**2.98E-02**
DRUMS																																						
Drums	2.05E+01	Drums	76.19%	3.38E-01	N/A	N/A	N/A	4.43E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.53E+00	N/A	4.06E-01	2.98E-02	5.93E-02	1.72E-03	1.72E-01	3.96E-01	6.99E-02	1.07E+00	1.06E-02	1.05E+00	2.79E+00	3.71E-02	1.50E-01	6.89E-02	9.55E-02
Subtotal				**3.38E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**4.43E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**5.53E+00**	**0.00E+00**	**4.06E-01**	**2.98E-02**	**5.93E-02**	**1.72E-03**	**1.72E-01**	**3.96E-01**	**6.99E-02**	**1.07E+00**	**1.06E-02**	**1.05E+00**	**2.79E+00**	**3.71E-02**	**1.50E-01**	**6.89E-02**	**9.55E-02**
WWTS																																						
Heavy Service Fugitives : WWTS	3.99E+03	L1	100.00%	4.46E-03	N/A	N/A	N/A	1.82E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.08E-02	N/A	N/A	N/A	N/A	1.76E-03	2.75E-02	2.25E-04	3.03E-04	1.35E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**4.46E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.82E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.08E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.76E-03**	**2.75E-02**	**2.25E-04**	**3.03E-04**	**1.35E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUELBLND																																						
Tank 600	8.03E+00	V6	100.00%	1.84E-01	N/A	N/A	N/A	2.41E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.28E+00	N/A	2.20E-01	1.62E-02	2.96E-02	9.34E-04	8.59E-02	N/A	3.49E-02	5.80E-01	5.78E-03	5.68E-01	1.51E+00	2.01E-02	8.14E-02	3.74E-02	5.19E-02
Light Service Fugitives: Fuel Blending	8.98E+02	L6	100.00%	8.53E-04	N/A	N/A	N/A	5.58E-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.69E-01	N/A	2.37E-04	3.80E-06	1.37E-02	4.80E-05	2.36E-04	N/A	2.24E-01	5.52E-03	4.18E-07	5.04E-03	8.06E-03	6.01E-02	1.33E-01	4.18E-03	1.01E-04
Subtotal				**1.84E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**2.41E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**3.45E+00**	**0.00E+00**	**2.21E-01**	**1.62E-02**	**4.33E-02**	**9.82E-04**	**8.61E-02**	**0.00E+00**	**2.59E-01**	**5.85E-01**	**5.78E-03**	**5.73E-01**	**1.52E+00**	**8.02E-02**	**2.15E-01**	**4.16E-02**	**5.20E-02**
OILTREAT																																						
Tank 21	1.06E+02	V2	100.00%	8.43E-01	7.14E+00	1.03E+00	1.06E-02	3.97E-01	4.94E-03	1.07E+00	1.25E+01	6.01E+00	3.03E+01	1.86E-02	1.25E+01	5.69E-01	7.59E+00	2.08E+01	5.76E-02	2.52E-02	7.49E-01	2.28E+00	1.03E-01	3.66E-02	1.60E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 22	1.17E+02	V2	100.00%	9.30E-01	7.88E+00	1.13E+00	1.17E-02	4.38E-01	5.45E-03	1.18E+00	1.38E+01	6.63E+00	3.34E+01	2.06E-02	1.38E+01	6.28E-01	8.38E+00	2.30E+01	6.35E-02	2.79E-02	8.26E-01	2.52E+00	1.14E-01	4.04E-02	1.76E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 23	1.17E+02	V2	100.00%	9.30E-01	7.88E+00	1.13E+00	1.17E-02	4.38E-01	5.45E-03	1.18E+00	1.38E+01	6.63E+00	3.34E+01	2.06E-02	1.38E+01	6.28E-01	8.38E+00	2.30E+01	6.35E-02	2.79E-02	8.26E-01	2.52E+00	1.14E-01	4.04E-02	1.76E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 24	1.06E+02	V2	100.00%	8.43E-01	7.14E+00	1.03E+00	1.06E-02	3.97E-01	4.94E-03	1.07E+00	1.25E+01	6.01E+00	3.03E+01	1.86E-02	1.25E+01	5.69E-01	7.59E+00	2.08E+01	5.76E-02	2.52E-02	7.49E-01	2.28E+00	1.03E-01	3.66E-02	1.60E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 25	1.06E+02	V2	100.00%	8.43E-01	7.14E+00	1.03E+00	1.06E-02	3.97E-01	4.94E-03	1.07E+00	1.25E+01	6.01E+00	3.03E+01	1.86E-02	1.25E+01	5.69E-01	7.59E+00	2.08E+01	5.76E-02	2.52E-02	7.49E-01	2.28E+00	1.03E-01	3.66E-02	1.60E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 26	1.06E+02	V2	100.00%	8.43E-01	7.14E+00	1.03E+00	1.06E-02	3.97E-01	4.94E-03	1.07E+00	1.25E+01	6.01E+00	3.03E+01	1.86E-02	1.25E+01	5.69E-01	7.59E+00	2.08E+01	5.76E-02	2.52E-02	7.49E-01	2.28E+00	1.03E-01	3.66E-02	1.60E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 27	1.06E+02	V2	100.00%	8.43E-01	7.14E+00	1.03E+00	1.06E-02	3.97E-01	4.94E-03	1.07E+00	1.25E+01	6.01E+00	3.03E+01	1.86E-02	1.25E+01	5.69E-01	7.59E+00	2.08E+01	5.76E-02	2.52E-02	7.49E-01	2.28E+00	1.03E-01	3.66E-02	1.60E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**6.08E+00**	**5.14E+01**	**7.40E+00**	**7.63E-02**	**2.86E+00**	**3.56E-02**	**7.72E+00**	**8.98E+01**	**4.33E+01**	**2.18E+02**	**1.34E-01**	**8.99E+01**	**4.10E+00**	**5.47E+01**	**1.50E+02**	**4.15E-01**	**1.82E-01**	**5.39E+00**	**1.65E+01**	**7.43E-01**	**2.64E-01**	**1.15E+01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
DAF																																						
DAF	1.01E+01	V1	100.00%	9.26E-02	9.32E-01	1.91E-01	2.64E-02	5.37E-02	6.15E-03	8.80E-02	1.06E+00	7.01E-01	1.97E+00	6.33E-02	1.43E+00	1.21E-01	6.98E-01	1.51E+00	1.26E-01	9.25E-03	1.17E-01	6.62E-01	1.47E-02	1.15E-02	2.66E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**9.26E-02**	**9.32E-01**	**1.91E-01**	**2.64E-02**	**5.37E-02**	**6.15E-03**	**8.80E-02**	**1.06E+00**	**7.01E-01**	**1.97E+00**	**6.33E-02**	**1.43E+00**	**1.21E-01**	**6.98E-01**	**1.51E+00**	**1.26E-01**	**9.25E-03**	**1.17E-01**	**6.62E-01**	**1.47E-02**	**1.15E-02**	**2.66E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
Filter Press																																						
Filter Press	1.69E+02	V1	100.00%	1.54E+00	1.55E+01	3.19E+00	4.39E-01	8.94E-01	1.03E-01	1.47E+00	1.76E+01	1.17E+01	3.28E+01	1.05E+00	2.38E+01	2.02E+00	1.16E+01	2.51E+01	2.10E+00	1.54E-01	1.94E+00	1.10E+01	2.44E-01	1.92E-01	4.43E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**1.54E+00**	**1.55E+01**	**3.19E+00**	**4.39E-01**	**8.94E-01**	**1.03E-01**	**1.47E+00**	**1.76E+01**	**1.17E+01**	**3.28E+01**	**1.05E+00**	**2.38E+01**	**2.02E+00**	**1.16E+01**	**2.51E+01**	**2.10E+00**	**1.54E-01**	**1.94E+00**	**1.10E+01**	**2.44E-01**	**1.92E-01**	**4.43E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG1																																						
Tank 40	1.52E-02	V1	100.00%	1.39E-04	1.40E-03	2.87E-04	3.95E-05	8.04E-05	9.22E-06	1.32E-04	1.58E-03	1.05E-03	2.95E-03	9.48E-05	2.14E-03	1.82E-04	1.05E-03	2.26E-03	1.89E-04	1.39E-05	1.75E-04	9.91E-04	2.20E-05	1.73E-05	3.98E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 41	1.80E-02	V1	100.00%	1.64E-04	1.65E-03	3.40E-04	4.68E-05	9.52E-05	1.09E-05	1.56E-04	1.87E-03	1.24E-03	3.49E-03	1.12E-04	2.53E-03	2.15E-04	1.24E-03	2.67E-03	2.23E-04	1.64E-05	2.07E-04	1.17E-03	2.60E-05	2.05E-05	4.72E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 42	1.80E-02	V1	100.00%	1.64E-04	1.65E-03	3.39E-04	4.67E-05	9.50E-05	1.09E-05	1.56E-04	1.87E-03	1.24E-03	3.49E-03	1.12E-04	2.52E-03	2.15E-04	1.24E-03	2.67E-03	2.23E-04	1.64E-05	2.06E-04	1.17E-03	2.59E-05	2.04E-05	4.71E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 43	1.92E-02	V1	100.00%	1.76E-04	1.77E-03	3.63E-04	5.01E-05	1.02E-04	1.17E-05	1.67E-04	2.01E-03	1.33E-03	3.74E-03	1.20E-04	2.71E-03	2.30E-04	1.33E-03	2.86E-03	2.39E-04	1.76E-05	2.21E-04	1.26E-03	2.78E-05	2.19E-05	5.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 44	1.55E-02	V1	100.00%	1.41E-04	1.42E-03	2.92E-04	4.02E-05	8.18E-05	9.38E-06	1.34E-04	1.61E-03	1.07E-03	3.00E-03	9.64E-05	2.17E-03	1.85E-04	1.06E-03	2.30E-03	1.92E-04	1.41E-05	1.78E-04	1.01E-03	2.23E-05	1.76E-05	4.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 45	1.55E-02	V1	100.00%	1.41E-04	1.42E-03	2.92E-04	4.02E-05	8.18E-05	9.38E-06	1.34E-04	1.61E-03	1.07E-03	3.00E-03	9.64E-05	2.17E-03	1.85E-04	1.06E-03	2.30E-03	1.92E-04	1.41E-05	1.78E-04	1.01E-03	2.23E-05	1.76E-05	4.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 46	1.55E-02	V1	100.00%	1.41E-04	1.42E-03	2.92E-04	4.02E-05	8.18E-05	9.38E-06	1.34E-04	1.61E-03	1.07E-03	3.00E-03	9.64E-05	2.17E-03	1.85E-04	1.06E-03	2.30E-03	1.92E-04	1.41E-05	1.78E-04	1.01E-03	2.23E-05	1.76E-05	4.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 47	4.89E-03	V1	100.00%	4.47E-05	4.50E-04	9.24E-05	1.27E-05	2.59E-05	2.97E-06	4.25E-05	5.10E-04	3.38E-04	9.51E-04	3.05E-05	6.88E-04	5.85E-05	3.37E-04	7.27E-04	6.08E-05	4.46E-06	5.63E-05	3.19E-04	7.07E-06	5.57E-06	1.28E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 48	1.55E-02	V1	100.00%	1.41E-04	1.42E-03	2.92E-04	4.02E-05	8.18E-05	9.38E-06	1.34E-04	1.61E-03	1.07E-03	3.00E-03	9.64E-05	2.17E-03	1.85E-04	1.06E-03	2.30E-03	1.92E-04	1.41E-05	1.78E-04	1.01E-03	2.23E-05	1.76E-05	4.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 49	1.55E-02	V1	100.00%	1.41E-04	1.42E-03	2.92E-04	4.02E-05	8.18E-05	9.38E-06	1.34E-04	1.61E-03	1.07E-03	3.00E-03	9.64E-05	2.17E-03	1.85E-04	1.06E-03	2.30E-03	1.92E-04	1.41E-05	1.78E-04	1.01E-03	2.23E-05	1.76E-05	4.05E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 50	6.23E-03	V1	100.00%	5.69E-05	5.72E-04	1.18E-04	1.62E-05	3.30E-05	3.78E-06	5.41E-05	6.49E-04	4.31E-04	1.21E-03	3.89E-05	8.76E-04	7.45E-05	4.29E-04	9.26E-04	7.74E-05	5.68E-06	7.16E-05	4.07E-04	9.00E-06	7.09E-06	1.63E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 52	4.01E-01	V1	100.00%	3.66E-03	3.68E-02	7.57E-03	1.04E-03	2.12E-03	2.43E-04	3.48E-03	4.18E-02	2.77E-02	7.79E-02	2.50E-03	5.64E-02	4.79E-03	2.76E-02	5.96E-02	4.98E-03	3.66E-04	4.61E-03	2.62E-02	5.79E-04	4.56E-04	1.05E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 53	1.85E-02	V1	100.00%	1.69E-04	1.70E-03	3.49E-04	4.81E-05	9.79E-05	1.12E-05	1.61E-04	1.93E-03	1.28E-03	3.59E-03	1.15E-04	2.60E-03	2.21E-04	1.27E-03	2.75E-03	2.30E-04	1.69E-05	2.13E-04	1.21E-03	2.67E-05	2.11E-05	4.85E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 54	3.70E-02	V1	100.00%	3.38E-04	3.40E-03	6.98E-04	9.62E-05	1.96E-04	2.24E-05	3.21E-04	3.85E-03	2.56E-03	7.18E-03	2.31E-04	5.20E-03	4.42E-04	2.55E-03	5.50E-03	4.59E-04	3.37E-05	4.25E-04	2.41E-03	5.35E-05	4.21E-05	9.70E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 55	1.12E-02	V1	100.00%	1.03E-04	1.03E-03	2.12E-04	2.92E-05	5.95E-05	6.82E-06	9.76E-05	1.17E-03	7.77E-04	2.18E-03	7.01E-05	1.58E-03	1.34E-04	7.74E-04	1.67E-03	1.40E-04	1.03E-05	1.29E-04	7.33E-04	1.62E-05	1.28E-05	2.95E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 56	1.27E-02	V1	100.00%	1.16E-04	1.16E-03	2.39E-04	3.29E-05	6.70E-05	7.68E-06	1.10E-04	1.32E-03	8.74E-04	2.46E-03	7.90E-05	1.78E-03	1.51E-04	8.71E-04	1.88E-03	1.57E-04	1.15E-05	1.45E-04	8.26E-04	1.83E-05	1.44E-05	3.32E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : GRS	2.15E+02	L1	100.00%	2.40E-04	N/A	N/A	N/A	9.80E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.81E-04	N/A	N/A	N/A	N/A	9.48E-05	1.48E-03	1.21E-05	1.63E-05	7.29E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Truck Loading/Unloading	1.80E+03	L1	50.00%	1.00E-03	N/A	N/A	N/A	4.09E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.43E-03	N/A	N/A	N/A	N/A	3.96E-04	6.19E-03	5.06E-05	6.80E-05	3.04E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Truck Loading/Unloading	2.15E+03	L1	71.43%	1.72E-03	N/A	N/A	N/A	7.00E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.15E-03	N/A	N/A	N/A	N/A	6.77E-04	1.06E-02	8.66E-05	1.16E-04	5.21E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : WST	3.07E+02	L1	100.00%	3.43E-04	N/A	N/A	N/A	1.40E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	N/A	N/A	N/A	N/A	1.35E-04	2.12E-03	1.73E-05	2.33E-05	1.04E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Oil Treatment	1.80E+03	L2	50.00%	5.69E-02	N/A	N/A	N/A	1.89E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.10E-02	N/A	N/A	N/A	N/A	1.58E-02	1.33E-01	2.22E-03	1.34E-03	1.14E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L1	50.00%	1.37E-03	N/A	N/A	N/A	5.60E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.32E-03	N/A	N/A	N/A	N/A	5.41E-04	8.47E-03	6.92E-05	9.31E-05	4.17E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L2	25.00%	3.89E-02	N/A	N/A	N/A	1.29E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.86E-02	N/A	N/A	N/A	N/A	1.08E-02	9.11E-02	1.52E-03	9.19E-04	7.80E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil/Water Separator	6.18E+02	L1	100.00%	6.90E-04	N/A	N/A	N/A	2.81E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.67E-03	N/A	N/A	N/A	N/A	2.72E-04	4.26E-03	3.48E-05	4.68E-05	2.09E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Centrifuge	8.45E+00	V1	100.00%	7.72E-02	7.76E-01	1.60E-01	2.20E-02	4.47E-02	5.13E-03	7.34E-02	8.80E-01	5.84E-01	1.64E+00	5.27E-02	1.19E+00	1.01E-01	5.81E-01	1.26E+00	1.05E-01	7.71E-03	9.71E-02	5.51E-01	1.22E-02	9.62E-03	2.22E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**1.84E-01**	**8.35E-01**	**1.72E-01**	**2.36E-02**	**8.20E-02**	**5.51E-03**	**7.89E-02**	**9.47E-01**	**6.28E-01**	**1.77E+00**	**5.67E-02**	**1.28E+00**	**2.41E-01**	**6.25E-01**	**1.35E+00**	**1.13E-01**	**8.29E-03**	**1.33E-01**	**8.50E-01**	**1.71E-02**	**1.30E-02**	**4.47E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG2																																						
Tank 300	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 400	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 500	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 700	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 800	0.00E+00	V1	100.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Truck Loading/Unloading	1.80E+03	L3	50.00%	1.11E-03	N/A	N/A	N/A	6.23E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.69E-03	N/A	N/A	N/A	N/A	6.06E-04	8.13E-03	7.09E-05	4.08E-05	4.62E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Oil Treatment	1.80E+03	L3	50.00%	1.11E-03	N/A	N/A	N/A	6.23E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.69E-03	N/A	N/A	N/A	N/A	6.06E-04	8.13E-03	7.09E-05	4.08E-05	4.62E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L3	12.50%	3.81E-04	N/A	N/A	N/A	2.13E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.20E-04	N/A	N/A	N/A	N/A	2.07E-04	2.78E-03	2.42E-05	1.40E-05	1.58E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**3.86E-03**	**2.94E-03**	**3.09E-04**	**7.99E-05**	**2.45E-03**	**7.46E-05**	**1.33E-03**	**1.63E-02**	**4.82E-03**	**1.84E-02**	**4.26E-05**	**4.23E-04**	**7.93E-03**	**4.23E-03**	**1.04E-02**	**1.17E-04**	**1.12E-04**	**3.58E-03**	**2.96E-02**	**4.15E-04**	**1.80E-04**	**1.57E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG3																																						
Tank 100	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 200	2.03E-02	V3	100.00%	3.12E-04	7.35E-04	7.74E-05	2.00E-05	2.47E-04	1.86E-05	3.34E-04	4.07E-03	1.21E-03	4.59E-03	1.07E-05	1.06E-04	4.07E-04	1.06E-03	2.60E-03	2.94E-05	2.80E-05	5.41E-04	2.63E-03	6.22E-05	2.10E-05	1.22E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Truck Loading/Unloading	2.15E+03	L3	14.29%	3.81E-04	N/A	N/A	N/A	2.13E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.20E-04	N/A	N/A	N/A	N/A	2.07E-04	2.78E-03	2.42E-05	1.40E-05	1.58E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L3	50.00%	7.63E-04	N/A	N/A	N/A	4.26E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.84E-03	N/A	N/A	N/A	N/A	4.15E-04	5.56E-03	4.85E-05	2.79E-05	3.16E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L3	12.50%	3.81E-04	N/A	N/A	N/A	2.13E-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.20E-04	N/A	N/A	N/A	N/A	2.07E-04	2.78E-03	2.42E-05	1.40E-05	1.58E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**2.15E-03**	**1.47E-03**	**1.55E-04**	**3.99E-05**	**1.35E-03**	**3.73E-05**	**6.67E-04**	**8.14E-03**	**2.41E-03**	**9.18E-03**	**2.13E-05**	**2.11E-04**	**4.49E-03**	**2.11E-03**	**5.19E-03**	**5.87E-05**	**5.61E-05**	**1.91E-03**	**1.64E-02**	**2.21E-04**	**9.78E-05**	**8.77E-03**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Source	Total VOC	Speciation	% Contribution to Speciation	Ethylene Dichloride	Formaldehyde	Hydrofluoric Acid	Acetaldehyde	Acrolein	Beryllium	1,3- Butadiene	Cadmium	Hexavalent Chromium	Lead	Manganese	Naphthalene	Nickel	PAHs	Styrene	Arsenic	Ammonia	Copper	Hydrogen Chloride	Mercury	Selenium
Weight Fractions																								
Vapor Speciation 1		V1		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 2		V2		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 3		V3		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Speciation 6		V6		2.47E-02	2.09E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 1		L1		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 2		L2		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 3		L3		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Liquid Speciation 6		L6		3.27E-06	4.93E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Speciation Drums		Drums		2.34E-02	2.15E-03	5.77E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LOAD(1-4) x 4																								
Loading Racks	1.20E-01	L1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Racks	5.75E+00	L6	100.00%	1.88E-05	2.83E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Truck Idling	2.05E+00	N/A	25.00%	N/A	2.36E-02	N/A	1.07E-02	4.64E-04	N/A	2.97E-03	2.05E-05	1.37E-06	1.14E-04	4.24E-05	2.69E-04	5.33E-05	4.95E-04	N/A	2.19E-05	3.97E-02	5.61E-05	2.55E-03	2.74E-05	3.01E-05
Subtotal				**1.88E-05**	**3.07E-01**	**0.00E+00**	**1.07E-02**	**4.64E-04**	**0.00E+00**	**2.97E-03**	**2.05E-05**	**1.37E-06**	**1.14E-04**	**4.24E-05**	**2.69E-04**	**5.33E-05**	**4.95E-04**	**0.00E+00**	**2.19E-05**	**3.97E-02**	**5.61E-05**	**2.55E-03**	**2.74E-05**	**3.01E-05**
RRLOAD1																								
Loading Rack	1.20E-01	L1	33.33%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	6.26E-06	9.44E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**6.26E-06**	**9.44E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
RRLOAD2																								
Loading Rack	1.20E-01	L1	33.33%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	6.26E-06	9.44E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L1	25.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**6.26E-06**	**9.44E-02**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
RRLOAD3																								
Loading Rack	1.20E-01	L1	33.33%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Loading Rack	5.75E+00	L6	33.33%	6.26E-06	9.44E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L1	25.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rail Idling	2.87E-02	N/A	100.00%	N/A	1.96E+00	N/A	7.59E-01	1.68E-01	7.67E-04	1.41E-01	7.67E-04	6.00E-05	2.37E-03	1.07E-08	6.14E-06	3.43E-08	1.25E-07	1.10E-05	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**6.26E-06**	**2.06E+00**	**0.00E+00**	**7.59E-01**	**1.68E-01**	**7.67E-04**	**1.41E-01**	**7.67E-04**	**6.00E-05**	**2.37E-03**	**1.07E-08**	**6.14E-06**	**3.43E-08**	**1.25E-07**	**1.10E-05**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
DRUMN																								
Drums	2.05E+01	Drums	23.81%	1.14E-01	1.05E-02	2.81E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**1.14E-01**	**1.05E-02**	**2.81E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
DRUMS																								
Drums	2.05E+01	Drums	76.19%	3.66E-01	3.36E-02	9.00E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**3.66E-01**	**3.36E-02**	**9.00E-01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
WWTS																								
Heavy Service Fugitives : WWTS	3.99E+03	L1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUELBLND																								
Tank 600	8.03E+00	V6	100.00%	1.99E-01	1.68E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives: Fuel Blending	8.98E+02	L6	100.00%	2.93E-03	4.42E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**2.01E-01**	**4.43E+01**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
OILTREAT																								
Tank 21	1.06E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 22	1.17E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 23	1.17E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 24	1.06E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 25	1.06E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 26	1.06E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 27	1.06E+02	V2	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
DAF																								
DAF	1.01E+01	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
Filter Press																								
Filter Press	1.69E+02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG1																								
Tank 40	1.52E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 41	1.80E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 42	1.80E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 43	1.92E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 44	1.55E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 45	1.55E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 46	1.55E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 47	4.89E-03	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 48	1.55E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 49	1.55E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 50	6.23E-03	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 52	4.01E-01	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 53	1.85E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 54	3.70E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 55	1.12E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 56	1.27E-02	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : GRS	2.15E+02	L1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Truck Loading/Unloading	1.80E+03	L1	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Truck Loading/Unloading	2.15E+03	L1	71.43%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : WST	3.07E+02	L1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Oil Treatment	1.80E+03	L2	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L1	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L2	25.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil/Water Separator	6.18E+02	L1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Centrifuge	8.45E+00	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG2																								
Tank 300	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 400	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 500	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 700	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 800	0.00E+00	V1	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Truck Loading/Unloading	1.80E+03	L3	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Light Service Fugitives : Oil Treatment	1.80E+03	L3	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L3	12.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**
FUG3																								
Tank 100	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tank 200	2.03E-02	V3	100.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Truck Loading/Unloading	2.15E+03	L3	14.29%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Rail Loading/Unloading	1.23E+03	L3	50.00%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Service Fugitives : Oil Treatment	2.46E+03	L3	12.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal				**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**

Speciation Profile #1									
Derived from tank vapor testing (Tank #24);									
Applicable to waste oil/water mixture at ambient temperature.									
Liquid Temperature, deg.F	75								
Vapor Temperature, deg.F	75								
Moisture, % v/v	<3								
VOC, % vol. as C_3 (Propane)	0.22					**psia**			
			Total MW$_v$ -->	**0.05**	***Total P$_v$ -->***	**0.0087171**			
Lab Chemical List	**Vapor Conc. (ppmv)**	**MW$_i$**	**Vapor Mol. Frac., Y$_i$**	**Y$_i$*MW$_i$**	**Vapor Wt. Frac., W$_i$**	**Vapor Partial Pressure Pi=14.7*Yi**	**Henry's Constant**	**Solubility in Water (mol/m^3)**	**Liquid Wt. Fraction**
Benzene	5.4	78.1	0.0000054	0.000422	0.0091	0.00007938	0.0055502	0.01430219	1.117E-06
Butane	73	58.1	0.000073	0.004241	0.0919	0.0010731			
Butane, iso-	15	58.1	0.000015	0.000872	0.0189	0.0002205			
Ethane	4	30	0.000004	0.00012	0.0026	0.0000588			
Ethylbenzene	2.3	106.2	0.0000023	0.000244	0.0053	0.00003381	0.0078806	0.00429028	4.556E-07
Ethylene	1	28	0.000001	0.000028	0.0006	0.0000147			
Heptane	4	100.2	0.000004	0.000401	0.0087	0.0000588			
Heptane, iso-	48	100.2	0.000048	0.00481	0.1042	0.0007056			
Hexane	37	86.2	0.000037	0.003189	0.0691	0.0005439			
Hexane, iso-	104	86.2	0.000104	0.008965	0.1943	0.0015288			
Methane	18	16	0.000018	0.000288	0.0062	0.0002646			
Methyl-tert-Butylether (MTBE)	73.6	88.17	0.0000736	0.006489	0.1406	0.00108192			
Methylene Chloride	6.5	84.9	0.0000065	0.000552	0.0120	0.00009555	0.003	0.03185	2.704E-06
Pentane	44	72.2	0.000044	0.003177	0.0688	0.0006468			
Pentane, iso-	95	72.2	0.000095	0.006859	0.1486	0.0013965			
Propane	13	44.1	0.000013	0.000573	0.0124	0.0001911			
Propene	1	42.1	0.000001	4.21E-05	0.0009	0.0000147			
Tetrachloroethylene	3.2	165.8	0.0000032	0.000531	0.0115	0.00004704	0.0177003	0.00265758	4.406E-07
Toluene	32.7	92.1	0.0000327	0.003012	0.0653	0.00048069	0.0064201	0.07487267	6.896E-06
Trichloroethane, 1,1,1-	0.5	133.4	0.0000005	6.67E-05	0.0014	0.00000735	0.0174002	0.00042241	5.635E-08
Trichloroethylene	0.4	131.4	0.0000004	5.26E-05	0.0011	0.00000588	0.0102002	0.00057646	7.575E-08
Xylenes (o-, m- & p-)	11.4	106.2	0.0000114	0.001211	0.0262	0.00016758	0.00525	0.03192	3.39E-06
Total	**593**	**1779.87**	**0.000593**	**0.046144**	**1.0000**	**0.0087171**			
H2O Vapor	3.00%	18	0.03	0.54		0.441			
Air	96.94%	29	0.9694	28.1126		14.25018			
Total	**1.00**		**1.00**	**28.70**		**14.70**			

Speciation Profile #2									
Derived from tank vapor testing (Process/Treatment Tank #27);									
Applicable to waste oil/water mixture at elevated temperature (180 °F).									
Liquid Temperature, deg.F	180								
Vapor Temperature, deg.F	182								
Moisture, % v/v	51.7								
VOC, % vol. as C_3 (Propane)	10.3					**psia**			
			Total MW_v -->	**2.99**	***Total P_v -->***	**0.54260346**			
Lab Chemical List	**Vapor Conc. (ppmv)**	**MW_i**	**Vapor Mol. Frac., Y_i**	**Y_i*MW_i**	**Vapor Wt. Frac., W_i**	**Vapor Partial Pressure Pi=14.7*Yi**	**Henry's Constant**	**Solubility in Water (mol/m^3)**	**Liquid Wt. Fraction**
Benzene	306	78.1	0.000306	0.023899	0.0080	0.0044982	0.00555	0.81045728	6.33E-05
Butane	3483	58.1	0.003483	0.202362	0.0676	0.0512001			
Butane, iso-	501	58.1	0.000501	0.029108	0.0097	0.0073647			
Ethane	10	30	0.00001	0.000300	0.0001	0.000147			
Ethylbenzene	106	106.2	0.000106	0.011257	0.0038	0.0015582	0.007881	0.19772606	2.1E-05
Ethylene	5	28	0.000005	0.000140	0.0000	0.0000735			
Heptane	303	100.2	0.000303	0.030361	0.0101	0.0044541			
Heptane, iso-	3527	100.2	0.003527	0.353405	0.1181	0.0518469			
Hexane	1976	86.2	0.001976	0.170331	0.0569	0.0290472			
Hexane, iso-	9966	86.2	0.009966	0.859069	0.2870	0.1465002			
Methane	33	16	0.000033	0.000528	0.0002	0.0004851			
Methyl-tert-Butylether (MTBE)	4013	88.17	0.004013	0.353826	0.1182	0.0589911			
Methylene Chloride	190	84.9	0.00019	0.016131	0.0054	0.002793	0.003	0.931	7.904E-05
Pentane	2981	72.2	0.002981	0.215228	0.0719	0.0438207			
Pentane, iso-	8170	72.2	0.00817	0.589874	0.1971	0.120099			
Propane	37	44.1	0.000037	0.001632	0.0005	0.0005439			
Propene	17	42.1	0.000017	0.000716	0.0002	0.0002499			
Tetrachloroethylene	128	165.8	0.000128	0.021222	0.0071	0.0018816	0.0177	0.10630328	1.763E-05
Toluene	703	92.1	0.000703	0.064746	0.0216	0.0103341	0.00642	1.60964782	0.0001482
Trichloroethane, 1,1,1-	21.9	133.4	0.0000219	0.002921	0.0010	0.00032193	0.0174	0.01850151	2.468E-06
Trichloroethylene	7.9	131.4	0.0000079	0.001038	0.0003	0.00011613	0.0102	0.01138507	1.496E-06
Xylenes (o-, m- & p-)	427	106.2	0.000427	0.045347	0.0151	0.0062769	0.00525	1.1956	0.000127
Total	**36911.8**	**1779.87**	**0.0369118**	**2.993443**	**1.0000**	**0.5426**			
H2O Vapor	51.70%	18	0.517	9.306		7.5999			
Air	44.61%	29	0.4461	12.9369		6.55767			
Total	**1.00**		**1.00**	**25.24**		**14.70**			

Speciation Profile #3									
Derived from tank vapor testing (Product Oil Tank #600);									
Note that tank #600 is proposed to be used as fuel blending in the future (not a product oil tank);									
Applicable to treated product oil mixture at ambient temperature.									
Liquid Temperature, deg.F	85								
Vapor Temperature, deg.F	85								
Moisture, % v/v	<4								
VOC, % vol. as C_3 (Propane)	0.19					**psia**			
			Total MW_v -->	**0.03**	***Total P_v -->***	**0.005197038**			
Lab Chemical List	**Vapor Conc. (ppmv)**	**MW_i**	**Vapor Mol. Frac., Y_i**	**Y_i*MW_i**	**Vapor Wt. Frac., W_i**	**Vapor Partial Pressure Pi=14.7*Yi**	**Henry's Constant**	**Solubility in Water (mol/m^3)**	**Liquid Wt. Fraction**
Benzene	6.0	78.1	0.000006	4.69E-04	0.0154	0.0000882	0.00555	0.01589132	1.241E-06
Butane	19	58.1	0.000019	1.10E-03	0.0362	0.0002793			
Butane, iso-	2	58.1	0.000002	1.16E-04	0.0038	0.0000294			
Ethane	1	30	0.000001	3.00E-05	0.0010	0.0000147			
Ethylbenzene	3.5	106.2	0.0000035	3.72E-04	0.0122	0.00005145	0.007881	0.00652869	6.933E-07
Ethylene	1	28	0.000001	2.80E-05	0.0009	0.0000147			
Heptane	5	100.2	0.000005	5.01E-04	0.0164	0.0000735			
Heptane, iso-	61	100.2	0.000061	6.11E-03	0.2002	0.0008967			
Hexane	21	86.2	0.000021	1.81E-03	0.0593	0.0003087			
Hexane, iso-	80	86.2	0.00008	6.90E-03	0.2259	0.001176			
Methane	1	16	0.000001	1.60E-05	0.0005	0.0000147			
Methyl-tert-Butylether (MTBE)	1.8	88.17	0.0000018	1.59E-04	0.0052	0.00002646			
Methylene Chloride	7.2	84.9	0.0000072	6.11E-04	0.0200	0.00010584	0.003	0.03528	2.995E-06
Pentane	22	72.2	0.000022	1.59E-03	0.0520	0.0003234			
Pentane, iso-	54	72.2	0.000054	3.90E-03	0.1277	0.0007938			
Propane	1	44.1	0.000001	4.41E-05	0.0014	0.0000147			
Propene	1	42.1	0.000001	4.21E-05	0.0014	0.0000147			
Tetrachloroethylene	4.9	165.8	0.0000049	8.12E-04	0.0266	0.00007203	0.0177	0.00406942	6.747E-07
Toluene	42.9	92.1	0.0000429	3.95E-03	0.1294	0.00063063	0.00642	0.09822744	9.047E-06
Trichloroethane, 1,1,1-	0.7	133.4	0.0000007	9.34E-05	0.0031	0.00001029	0.0174	0.00059137	7.889E-08
Trichloroethylene	0.24	131.4	0.00000024	3.15E-05	0.0010	0.000003528	0.0102	0.00034588	4.545E-08
Xylenes (o-, m- & p-)	17.3	106.2	0.0000173	1.84E-03	0.0602	0.00025431	0.00525	0.04844	5.144E-06
Total	**354**	**1779.9**	**0.00035354**	**0.030523**	**1**	**0.005197038**			
H2O Vapor	4.00%	18	0.04	0.72		0.588			
Air	95.96%	29	0.9596	27.8284		14.10612			
Total	**1.00**		**1.00**	**28.58**		**14.70**			

Speciation Profile #6

Waste Code Description	Molecular Weight	Partial Vapor Pressure(1)	Vapor Mole Fraction(1)	Vapor Weight Fraction	Henry's Constant	Solubility in Water (mol/m^3)	Liquid Wt. Fraction(1)
acrylonitrile	53.0634	3.87E-02	0.0001	0.0037	9.80E-05	3.95E+02	1.53E-05
aniline	93.1280	3.10E-04	0.0000	0.0001	1.80E-06	1.72E+02	5.34E-08
benzene	78.1134	7.26E-02	0.0004	0.0229	5.55E-03	1.31E+01	9.50E-07
carbon tetrachloride	153.8230	8.91E-02	0.0001	0.0107	3.02E-02	2.95E+00	2.63E-07
chloroethene (1,1,1-TCA and vinyl chloride)	62.4987	2.57E+00	0.0001	0.0043	2.65E-02	9.70E+01	2.49E-04
chloroform	119.3779	1.50E-01	0.0009	0.0722	3.66E-03	4.10E+01	6.15E-06
dichlorobenzene, 1,4 (dichlorobenzene, p)	147.0036	1.22E-03	0.0000	0.0007	3.17E-03	3.83E-01	4.66E-10
dichloroethane, 1,1	98.9596	1.77E-01	0.0010	0.0707	5.60E-03	3.17E+01	5.62E-06
dichloroethylene, 1,1 (vinylidene chloride)	96.9438	4.82E-01	0.0028	0.1883	2.59E-02	1.86E+01	8.98E-06
dichloromethane (methylene chloride)	84.9328	3.41E-01	0.0020	0.1167	3.00E-03	1.14E+02	3.88E-05
dimethylhydrazine, 1,1 (UDMH)	60.0986	1.03E-02	0.0001	0.0025	1.60E-06	6.47E+03	6.69E-05
dioxane, 1,4	88.1060	2.86E-02	0.0002	0.0101	5.50E-06	5.19E+03	1.48E-04
epichlorohydrin	92.5249	1.25E-02	0.0001	0.0047	3.35E-05	3.73E+02	4.66E-06
Ethylbenzene	106.167	7.00E-03	0.0000	0.0030	7.88E-03	8.88E-01	6.22E-09
ethylene dibromide	187.8616	8.53E-03	0.0000	0.0065	6.50E-04	1.31E+01	1.12E-07
ethylene dichloride	98.9596	6.20E-02	0.0004	0.0247	1.18E-03	5.27E+01	3.27E-06
formaldehyde	30.0262	3.39E+00	0.0001	0.0021	3.00E-07	1.13E+07	4.93E-02
tetrachloroethylene (perchloroethylene)	165.8340	1.35E-02	0.0001	0.0090	1.77E-02	7.65E-01	1.04E-08
Toluene	92.1402	1.10E+00	0.0064	0.4084	6.42E-03	1.71E+02	1.88E-04
trichloroethane	133.4047	1.72E-02	0.0001	0.0092	1.74E-02	9.87E-01	1.69E-08
trichloroethylene	131.3889	5.18E-02	0.0003	0.0274	1.02E-02	5.08E+00	2.63E-07
Xylenes (o-, m- & p-)	106.167	4.71E-03	0.0000	0.0020	5.25E-03	8.97E-01	4.23E-09
Totals	**1.4390**	**1.00E-02**	**0.0151**	**1.0000**			5.00E-02

(1) Toxics taken at 5% concentration of total RCRA waste. Acrylonitrile, Carbon Tetrachloride, Formaldehyde, and Vinyl chloride are taken at 100 parts per million.

Speciation Profile Drums

Waste Code Description	Molecular Weight	Partial Vapor Pressure(1)	Vapor Mole Fraction(1)	Vapor Weight Fraction
acrylonitrile	53.0634	3.87E-02	0.0001	0.0038
aniline	93.1280	3.10E-04	0.0000	0.0001
benzene	78.1134	7.26E-02	0.0004	0.0217
carbon tetrachloride	153.8230	8.91E-02	0.0001	0.0110
chloroethene (1,1,1-TCA and vinyl chloride)	62.4987	2.57E+00	0.0001	0.0045
chloroform	119.3779	1.50E-01	0.0008	0.0684
dichlorobenzene, 1,4 (dichlorobenzene, p)	147.0036	1.22E-03	0.0000	0.0007
dichloroethane, 1,1	98.9596	1.77E-01	0.0009	0.0670
dichloroethylene, 1,1 (vinylidene chloride)	96.9438	4.82E-01	0.0026	0.1786
dichloromethane (methylene chloride)	84.9328	3.41E-01	0.0018	0.1107
dimethylhydrazine, 1,1 (UDMH)	60.0986	1.03E-02	0.0001	0.0024
dioxane, 1,4	88.1060	2.86E-02	0.0002	0.0096
epichlorohydrin	92.5249	1.25E-02	0.0001	0.0044
Ethylbenzene	106.167	7.00E-03	0.0000	0.0028
ethylene dibromide	187.8616	8.53E-03	0.0000	0.0061
ethylene dichloride	98.9596	6.20E-02	0.0003	0.0234
formaldehyde	30.0262	3.39E+00	0.0001	0.0022
hydrofluoric acid	20.0063	7.55E-01	0.0040	0.0577
tetrachloroethylene (perchloroethylene)	165.8340	1.35E-02	0.0001	0.0086
Toluene	92.1402	1.10E+00	0.0054	0.3542
trichloroethane	133.4047	1.72E-02	0.0001	0.0088
trichloroethylene	131.3889	5.18E-02	0.0003	0.0260
Xylenes (o-, m- & p-)	106.167	4.71E-03	0.0000	0.0019
chlorine	70.9060	5.00E+00	0.0005	0.0254
Totals	**1.3955**	**1.43E-02**	**0.0180**	**1.0000**

(1) Toxics taken at 5% concentration of total RCRA waste. Acrylonitrile, Carbon Tetrachloride, Formaldehyde and Vinyl chloride are taken at 100 parts per million.

APPENDIX B

Selected IRAP Results

RECEPTOR NAME	SCENARIO	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
IND1	resident_adult	9.9454E-006	3.6818E-001
IND2	resident_adult	2.6731E-008	7.9063E-004
RES1	resident_adult	1.5298E-007	4.5619E-003
RES1	resident_child	6.8242E-008	9.9886E-003
RES2	resident_adult	1.1645E-006	3.3392E-002
RES2	resident_child	5.1875E-007	7.3017E-002
RES3	resident_adult	1.9217E-007	5.8187E-003
RES3	resident_child	8.5730E-008	1.2746E-002
SEN01	resident_adult	4.0908E-007	1.2313E-002
SEN01	resident_child	1.8248E-007	2.6968E-002
SEN02	resident_adult	2.6731E-008	7.9063E-004
SEN02	resident_child	1.1919E-008	1.7290E-003
SEN03	resident_adult	9.2564E-007	2.7348E-002
SEN03	resident_child	4.1270E-007	5.9870E-002
SEN04	resident_adult	1.0442E-006	3.1658E-002
SEN04	resident_child	4.6593E-007	6.9383E-002
SEN05	resident_adult	2.7205E-007	8.1045E-003
SEN05	resident_child	1.2130E-007	1.7736E-002
SEN06	resident_adult	4.1485E-008	1.2089E-003
SEN06	resident_child	1.8487E-008	2.6412E-003
SEN07	resident_adult	3.3192E-008	9.8786E-004
SEN07	resident_child	1.4799E-008	2.1597E-003
SEN08	resident_adult	4.0611E-008	1.2238E-003
SEN08	resident_child	1.8117E-008	2.6794E-003
SEN09	resident_adult	3.4158E-008	1.0251E-003
SEN09	resident_child	1.5238E-008	2.2437E-003
SEN10	resident_adult	8.4738E-007	2.5320E-002
SEN10	resident_child	3.7794E-007	5.5454E-002
SEN11	resident_adult	3.5517E-007	1.0548E-002
SEN11	resident_child	1.5837E-007	2.3086E-002

RISK SUMMARY BY EXPOSURE PATHWAYS

Date : 11/10/2005

RECEPTOR : IND1

SCENARIO: resident_adult

	Inhalation	Soil	Water	Produce	Beef
CANCER:	9.672E-006	7.267E-008	0.000E+000	2.008E-007	0.000E+000
HAZARD:	3.576E-001	4.404E-006	0.000E+000	1.062E-002	0.000E+000

	Milk	Poultry	Eggs	Pork	Fish
CANCER:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000
HAZARD:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000

RISK SUMMARY BY EXPOSURE PATHWAYS

Date : 11/10/2005

RECEPTOR : IND2

SCENARIO: resident_adult

	Inhalation	Soil	Water	Produce	Beef
CANCER:	2.658E-008	3.990E-011	0.000E+000	1.099E-010	0.000E+000
HAZARD:	7.518E-004	1.736E-008	0.000E+000	3.884E-005	0.000E+000

	Milk	Poultry	Eggs	Pork	Fish
CANCER:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000
HAZARD:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000

RISK SUMMARY BY EXPOSURE PATHWAYS

Date : 11/10/2005

RECEPTOR : RES2

SCENARIO: resident_adult

	Inhalation	Soil	Water	Produce	Beef
CANCER:	1.160E-006	1.248E-009	0.000E+000	3.456E-009	0.000E+000
HAZARD:	3.174E-002	7.628E-007	0.000E+000	1.649E-003	0.000E+000

	Milk	Poultry	Eggs	Pork	Fish
CANCER:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000
HAZARD:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000

RISK SUMMARY BY EXPOSURE PATHWAYS

Date : 11/10/2005

RECEPTOR : SEN04

SCENARIO: resident_adult

	Inhalation	Soil	Water	Produce	Beef
CANCER:	1.037E-006	1.916E-009	0.000E+000	5.303E-009	0.000E+000
HAZARD:	3.031E-002	6.246E-007	0.000E+000	1.343E-003	0.000E+000

	Milk	Poultry	Eggs	Pork	Fish
CANCER:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000
HAZARD:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000

RISK SUMMARY BY EXPOSURE PATHWAYS

Date : 11/10/2005

RECEPTOR : SEN04

SCENARIO: resident_child

	Inhalation	Soil	Water	Produce	Beef
CANCER:	4.609E-007	3.577E-009	0.000E+000	1.484E-009	0.000E+000
HAZARD:	6.737E-002	5.830E-006	0.000E+000	2.012E-003	0.000E+000

	Milk	Poultry	Eggs	Pork	Fish
CANCER:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000
HAZARD:	0.000E+000	0.000E+000	0.000E+000	0.000E+000	0.000E+000

Receptor	Population	Source	COPC	Cancer	Hazard
IND1	**resident_adult**	**BOILER1**	Acetaldehyde	1.17E-10	1.17E-03
IND1	**resident_adult**	**BOILER1**	Acrolein	0.00E+00	2.99E-03
IND1	**resident_adult**	**BOILER1**	Benzene	2.17E-09	2.96E-06
IND1	**resident_adult**	**BOILER1**	Benzo(a)pyrene	3.85E-09	0.00E+00
IND1	**resident_adult**	**BOILER1**	Ethylbenzene	0.00E+00	2.14E-07
IND1	**resident_adult**	**BOILER1**	Formaldehyde	9.69E-10	1.26E-04
IND1	**resident_adult**	**BOILER1**	Naphthalene	9.76E-11	7.09E-08
IND1	**resident_adult**	**BOILER1**	Toluene	0.00E+00	2.03E-06
IND1	**resident_adult**	**BOILER1**	Xylene, m-	0.00E+00	8.68E-08
IND1	**resident_adult**	**BOILER2**	Acetaldehyde	1.27E-10	1.27E-03
IND1	**resident_adult**	**BOILER2**	Acrolein	0.00E+00	3.24E-03
IND1	**resident_adult**	**BOILER2**	Benzene	2.35E-09	3.22E-06
IND1	**resident_adult**	**BOILER2**	Benzo(a)pyrene	4.18E-09	0.00E+00
IND1	**resident_adult**	**BOILER2**	Ethylbenzene	0.00E+00	2.32E-07
IND1	**resident_adult**	**BOILER2**	Formaldehyde	1.05E-09	1.37E-04
IND1	**resident_adult**	**BOILER2**	Naphthalene	1.06E-10	7.70E-08
IND1	**resident_adult**	**BOILER2**	Toluene	0.00E+00	2.20E-06
IND1	**resident_adult**	**BOILER2**	Xylene, m-	0.00E+00	9.42E-08
IND1	**resident_adult**	**BUGEN**	Acetaldehyde	1.58E-10	1.59E-03
IND1	**resident_adult**	**BUGEN**	Acrolein	0.00E+00	2.80E-04
IND1	**resident_adult**	**BUGEN**	Arsenic	3.90E-10	9.16E-06
IND1	**resident_adult**	**BUGEN**	Benzene	3.77E-10	5.15E-07
IND1	**resident_adult**	**BUGEN**	Cadmium	4.55E-10	1.77E-05
IND1	**resident_adult**	**BUGEN**	Chromium, hexavalent	1.03E-09	9.96E-10
IND1	**resident_adult**	**BUGEN**	Ethylbenzene	0.00E+00	1.83E-09
IND1	**resident_adult**	**BUGEN**	Formaldehyde	7.32E-10	9.53E-05
IND1	**resident_adult**	**BUGEN**	Hydrogen chloride	0.00E+00	1.55E-06
IND1	**resident_adult**	**BUGEN**	Lead	7.59E-12	0.00E+00
IND1	**resident_adult**	**BUGEN**	Mercury	0.00E+00	3.67E-06
IND1	**resident_adult**	**BUGEN**	Naphthalene	4.78E-11	3.48E-08
IND1	**resident_adult**	**BUGEN**	Nickel	7.18E-11	1.37E-05
IND1	**resident_adult**	**BUGEN**	Selenium	0.00E+00	2.14E-08
IND1	**resident_adult**	**BUGEN**	Toluene	0.00E+00	4.36E-08
IND1	**resident_adult**	**BUGEN**	Xylene, m-	0.00E+00	1.01E-09
IND1	**resident_adult**	**DAF**	Benzene	1.63E-09	2.22E-06
IND1	**resident_adult**	**DAF**	Ethylbenzene	0.00E+00	7.84E-08
IND1	**resident_adult**	**DAF**	Methylene chloride	7.44E-11	6.04E-08
IND1	**resident_adult**	**DAF**	Tetrachloroethylene (Perchloroethylene)	4.31E-10	4.80E-06
IND1	**resident_adult**	**DAF**	Toluene	0.00E+00	2.38E-06
IND1	**resident_adult**	**DAF**	Trichloroethane, 1,1,1-	0.00E+00	1.72E-07
IND1	**resident_adult**	**DAF**	Trichloroethylene	1.42E-11	7.91E-07
IND1	**resident_adult**	**DAF**	Xylene, m-	0.00E+00	5.49E-08
IND1	**resident_adult**	**DRUMN**	Acrylonitrile	3.51E-08	1.46E-04
IND1	**resident_adult**	**DRUMN**	Aniline	5.80E-12	1.09E-05
IND1	**resident_adult**	**DRUMN**	Benzene	2.00E-08	2.74E-05
IND1	**resident_adult**	**DRUMN**	Carbon tetrachloride	1.53E-08	3.40E-04
IND1	**resident_adult**	**DRUMN**	Chlorine	0.00E+00	5.49E-06
IND1	**resident_adult**	**DRUMN**	Chloroform (Trichloromethane)	1.20E-08	1.48E-04
IND1	**resident_adult**	**DRUMN**	Dichlorobenzene,1,4-	2.52E-10	8.91E-08
IND1	**resident_adult**	**DRUMN**	Dichloroethane 1,1-	3.53E-09	1.01E-05
IND1	**resident_adult**	**DRUMN**	Dichloroethane, 1,2- (Ethylene Dichloride)	1.55E-08	1.75E-04
IND1	**resident_adult**	**DRUMN**	Dichloroethylene 1,1-	0.00E+00	4.27E-04
IND1	**resident_adult**	**DRUMN**	Dioxane, 1,4-	2.40E-09	0.00E+00
IND1	**resident_adult**	**DRUMN**	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	3.26E-09	3.43E-04
IND1	**resident_adult**	**DRUMN**	Ethylbenzene	0.00E+00	2.18E-07
IND1	**resident_adult**	**DRUMN**	Ethylene Dibromide	1.41E-08	2.53E-03

IND1	resident_adult	DRUMN	Formaldehyde	4.17E-10	5.43E-05
IND1	resident_adult	DRUMN	Toluene	0.00E+00	6.68E-05
IND1	resident_adult	DRUMN	Trichloroethylene	1.68E-09	9.35E-05
IND1	resident_adult	DRUMN	Vinyl Chloride	1.12E-08	0.00E+00
IND1	resident_adult	DRUMN	Xylene, m-	0.00E+00	2.08E-08
IND1	resident_adult	DRUMS	Acrylonitrile	6.03E-07	2.50E-03
IND1	resident_adult	DRUMS	Aniline	9.96E-11	1.87E-04
IND1	resident_adult	DRUMS	Benzene	3.43E-07	4.70E-04
IND1	resident_adult	DRUMS	Carbon tetrachloride	2.62E-07	5.83E-03
IND1	resident_adult	DRUMS	Chlorine	0.00E+00	9.42E-05
IND1	resident_adult	DRUMS	Chloroform (Trichloromethane)	2.06E-07	2.54E-03
IND1	resident_adult	DRUMS	Dichlorobenzene,1,4-	4.32E-09	1.53E-06
IND1	resident_adult	DRUMS	Dichloroethane 1,1-	6.05E-08	1.74E-04
IND1	resident_adult	DRUMS	Dichloroethane, 1,2- (Ethylene Dichloride)	2.67E-07	3.01E-03
IND1	resident_adult	DRUMS	Dichloroethylene 1,1-	0.00E+00	7.33E-03
IND1	resident_adult	DRUMS	Dioxane, 1,4-	4.11E-08	0.00E+00
IND1	resident_adult	DRUMS	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	5.60E-08	5.89E-03
IND1	resident_adult	DRUMS	Ethylbenzene	0.00E+00	3.74E-06
IND1	resident_adult	DRUMS	Ethylene Dibromide	2.42E-07	4.34E-02
IND1	resident_adult	DRUMS	Formaldehyde	7.17E-09	9.32E-04
IND1	resident_adult	DRUMS	Toluene	0.00E+00	1.15E-03
IND1	resident_adult	DRUMS	Trichloroethylene	2.88E-08	1.60E-03
IND1	resident_adult	DRUMS	Vinyl Chloride	1.92E-07	0.00E+00
IND1	resident_adult	DRUMS	Xylene, m-	0.00E+00	3.56E-07
IND1	resident_adult	FUELBLND	Acrylonitrile	6.79E-08	2.81E-04
IND1	resident_adult	FUELBLND	Aniline	8.76E-12	1.65E-05
IND1	resident_adult	FUELBLND	Benzene	2.89E-08	3.95E-05
IND1	resident_adult	FUELBLND	Carbon tetrachloride	2.03E-08	4.51E-04
IND1	resident_adult	FUELBLND	Chloroform (Trichloromethane)	1.74E-08	2.15E-04
IND1	resident_adult	FUELBLND	Dichlorobenzene,1,4-	3.62E-10	1.28E-07
IND1	resident_adult	FUELBLND	Dichloroethane 1,1-	5.12E-09	1.47E-05
IND1	resident_adult	FUELBLND	Dichloroethane, 1,2- (Ethylene Dichloride)	2.28E-08	2.56E-04
IND1	resident_adult	FUELBLND	Dichloroethylene 1,1-	0.00E+00	6.19E-04
IND1	resident_adult	FUELBLND	Dioxane, 1,4-	9.09E-09	0.00E+00
IND1	resident_adult	FUELBLND	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	5.21E-09	5.48E-04
IND1	resident_adult	FUELBLND	Ethylbenzene	0.00E+00	3.13E-07
IND1	resident_adult	FUELBLND	Ethylene Dibromide	2.03E-08	3.64E-03
IND1	resident_adult	FUELBLND	Formaldehyde	1.46E-06	1.90E-01
IND1	resident_adult	FUELBLND	Toluene	0.00E+00	1.11E-04
IND1	resident_adult	FUELBLND	Trichloroethylene	2.43E-09	1.36E-04
IND1	resident_adult	FUELBLND	Vinyl Chloride	1.09E-07	0.00E+00
IND1	resident_adult	FUELBLND	Xylene, m-	0.00E+00	2.99E-08
IND1	resident_adult	FUG1	Benzene	4.23E-07	5.79E-04
IND1	resident_adult	FUG1	Ethylbenzene	0.00E+00	1.57E-05
IND1	resident_adult	FUG1	Methylene chloride	1.94E-08	1.57E-05
IND1	resident_adult	FUG1	Tetrachloroethylene (Perchloroethylene)	6.44E-08	7.17E-04
IND1	resident_adult	FUG1	Toluene	0.00E+00	3.99E-04
IND1	resident_adult	FUG1	Trichloroethane, 1,1,1-	0.00E+00	2.63E-05
IND1	resident_adult	FUG1	Trichloroethylene	2.09E-09	1.17E-04
IND1	resident_adult	FUG1	Xylene, m-	0.00E+00	1.21E-05
IND1	resident_adult	FUG2	Benzene	1.02E-08	1.39E-05
IND1	resident_adult	FUG2	Ethylbenzene	0.00E+00	5.37E-07
IND1	resident_adult	FUG2	Methylene chloride	7.33E-10	5.95E-07
IND1	resident_adult	FUG2	Tetrachloroethylene (Perchloroethylene)	1.99E-09	2.21E-05
IND1	resident_adult	FUG2	Toluene	0.00E+00	1.60E-05
IND1	resident_adult	FUG2	Trichloroethane, 1,1,1-	0.00E+00	7.32E-07
IND1	resident_adult	FUG2	Trichloroethylene	3.32E-11	1.85E-06

IND1	resident_adult	FUG2	Xylene, m-	0.00E+00	4.89E-07
IND1	resident_adult	FUG3	Benzene	2.08E-09	2.85E-06
IND1	resident_adult	FUG3	Ethylbenzene	0.00E+00	1.09E-07
IND1	resident_adult	FUG3	Methylene chloride	1.52E-10	1.24E-07
IND1	resident_adult	FUG3	Tetrachloroethylene (Perchloroethylene)	3.89E-10	4.33E-06
IND1	resident_adult	FUG3	Toluene	0.00E+00	3.25E-06
IND1	resident_adult	FUG3	Trichloroethane, 1,1,1-	0.00E+00	1.43E-07
IND1	resident_adult	FUG3	Trichloroethylene	6.65E-12	3.71E-07
IND1	resident_adult	FUG3	Xylene, m-	0.00E+00	9.99E-08
IND1	resident_adult	H1	Acetaldehyde	1.56E-11	1.56E-04
IND1	resident_adult	H1	Acrolein	0.00E+00	3.99E-04
IND1	resident_adult	H1	Benzene	2.90E-10	3.96E-07
IND1	resident_adult	H1	Benzo(a)pyrene	5.20E-10	0.00E+00
IND1	resident_adult	H1	Ethylbenzene	0.00E+00	2.85E-08
IND1	resident_adult	H1	Formaldehyde	1.29E-10	1.68E-05
IND1	resident_adult	H1	Naphthalene	1.30E-11	9.48E-09
IND1	resident_adult	H1	Toluene	0.00E+00	2.71E-07
IND1	resident_adult	H1	Xylene, m-	0.00E+00	1.16E-08
IND1	resident_adult	H2	Acetaldehyde	1.70E-11	1.71E-04
IND1	resident_adult	H2	Acrolein	0.00E+00	4.36E-04
IND1	resident_adult	H2	Benzene	3.17E-10	4.34E-07
IND1	resident_adult	H2	Benzo(a)pyrene	5.69E-10	0.00E+00
IND1	resident_adult	H2	Ethylbenzene	0.00E+00	3.12E-08
IND1	resident_adult	H2	Formaldehyde	1.41E-10	1.84E-05
IND1	resident_adult	H2	Naphthalene	1.43E-11	1.04E-08
IND1	resident_adult	H2	Toluene	0.00E+00	2.96E-07
IND1	resident_adult	H2	Xylene, m-	0.00E+00	1.27E-08
IND1	resident_adult	LOAD1	Acrylonitrile	3.42E-10	1.42E-06
IND1	resident_adult	LOAD1	Aniline	6.83E-15	1.29E-08
IND1	resident_adult	LOAD1	Benzene	2.19E-12	2.99E-09
IND1	resident_adult	LOAD1	Carbon tetrachloride	8.84E-13	1.97E-08
IND1	resident_adult	LOAD1	Chloroform (Trichloromethane)	2.62E-12	3.24E-08
IND1	resident_adult	LOAD1	Dichlorobenzene,1,4-	4.18E-16	1.48E-13
IND1	resident_adult	LOAD1	Dichloroethane 1,1-	7.19E-13	2.07E-09
IND1	resident_adult	LOAD1	Dichloroethane, 1,2- (Ethylene Dichloride)	5.28E-12	5.95E-08
IND1	resident_adult	LOAD1	Dichloroethylene 1,1-	0.00E+00	5.23E-08
IND1	resident_adult	LOAD1	Dioxane, 1,4-	9.02E-11	0.00E+00
IND1	resident_adult	LOAD1	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	8.37E-12	8.79E-07
IND1	resident_adult	LOAD1	Ethylbenzene	0.00E+00	2.93E-12
IND1	resident_adult	LOAD1	Ethylene Dibromide	6.28E-13	1.12E-07
IND1	resident_adult	LOAD1	Formaldehyde	2.32E-08	3.02E-03
IND1	resident_adult	LOAD1	Methylene chloride	4.42E-15	3.59E-12
IND1	resident_adult	LOAD1	Tetrachloroethylene (Perchloroethylene)	4.32E-15	4.81E-11
IND1	resident_adult	LOAD1	Toluene	0.00E+00	8.67E-08
IND1	resident_adult	LOAD1	Trichloroethane, 1,1,1-	0.00E+00	1.76E-12
IND1	resident_adult	LOAD1	Trichloroethylene	4.16E-14	2.32E-09
IND1	resident_adult	LOAD1	Vinyl Chloride	1.51E-09	0.00E+00
IND1	resident_adult	LOAD1	Xylene, m-	0.00E+00	1.98E-12
IND1	resident_adult	LOAD2	Acrylonitrile	4.42E-10	1.83E-06
IND1	resident_adult	LOAD2	Aniline	8.82E-15	1.66E-08
IND1	resident_adult	LOAD2	Benzene	2.83E-12	3.86E-09
IND1	resident_adult	LOAD2	Carbon tetrachloride	1.14E-12	2.54E-08
IND1	resident_adult	LOAD2	Chloroform (Trichloromethane)	3.39E-12	4.18E-08
IND1	resident_adult	LOAD2	Dichlorobenzene,1,4-	5.41E-16	1.91E-13
IND1	resident_adult	LOAD2	Dichloroethane 1,1-	9.28E-13	2.67E-09
IND1	resident_adult	LOAD2	Dichloroethane, 1,2- (Ethylene Dichloride)	6.82E-12	7.69E-08
IND1	resident_adult	LOAD2	Dichloroethylene 1,1-	0.00E+00	6.76E-08

IND1	resident_adult	LOAD2	Dioxane, 1,4-	1.17E-10	0.00E+00
IND1	resident_adult	LOAD2	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	1.08E-11	1.14E-06
IND1	resident_adult	LOAD2	Ethylbenzene	0.00E+00	3.79E-12
IND1	resident_adult	LOAD2	Ethylene Dibromide	8.12E-13	1.45E-07
IND1	resident_adult	LOAD2	Formaldehyde	3.00E-08	3.90E-03
IND1	resident_adult	LOAD2	Methylene chloride	5.71E-15	4.64E-12
IND1	resident_adult	LOAD2	Tetrachloroethylene (Perchloroethylene)	5.58E-15	6.21E-11
IND1	resident_adult	LOAD2	Toluene	0.00E+00	1.12E-07
IND1	resident_adult	LOAD2	Trichloroethane, 1,1,1-	0.00E+00	2.27E-12
IND1	resident_adult	LOAD2	Trichloroethylene	5.38E-14	3.00E-09
IND1	resident_adult	LOAD2	Vinyl Chloride	1.95E-09	0.00E+00
IND1	resident_adult	LOAD2	Xylene, m-	0.00E+00	2.55E-12
IND1	resident_adult	LOAD3	Acrylonitrile	5.94E-10	2.46E-06
IND1	resident_adult	LOAD3	Aniline	1.19E-14	2.23E-08
IND1	resident_adult	LOAD3	Benzene	3.80E-12	5.19E-09
IND1	resident_adult	LOAD3	Carbon tetrachloride	1.54E-12	3.42E-08
IND1	resident_adult	LOAD3	Chloroform (Trichloromethane)	4.55E-12	5.62E-08
IND1	resident_adult	LOAD3	Dichlorobenzene,1,4-	7.27E-16	2.57E-13
IND1	resident_adult	LOAD3	Dichloroethane 1,1-	1.25E-12	3.59E-09
IND1	resident_adult	LOAD3	Dichloroethane, 1,2- (Ethylene Dichloride)	9.17E-12	1.03E-07
IND1	resident_adult	LOAD3	Dichloroethylene 1,1-	0.00E+00	9.08E-08
IND1	resident_adult	LOAD3	Dioxane, 1,4-	1.57E-10	0.00E+00
IND1	resident_adult	LOAD3	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	1.45E-11	1.53E-06
IND1	resident_adult	LOAD3	Ethylbenzene	0.00E+00	5.09E-12
IND1	resident_adult	LOAD3	Ethylene Dibromide	1.09E-12	1.95E-07
IND1	resident_adult	LOAD3	Formaldehyde	4.03E-08	5.25E-03
IND1	resident_adult	LOAD3	Methylene chloride	7.68E-15	6.23E-12
IND1	resident_adult	LOAD3	Tetrachloroethylene (Perchloroethylene)	7.50E-15	8.35E-11
IND1	resident_adult	LOAD3	Toluene	0.00E+00	1.51E-07
IND1	resident_adult	LOAD3	Trichloroethane, 1,1,1-	0.00E+00	3.05E-12
IND1	resident_adult	LOAD3	Trichloroethylene	7.23E-14	4.03E-09
IND1	resident_adult	LOAD3	Vinyl Chloride	2.62E-09	0.00E+00
IND1	resident_adult	LOAD3	Xylene, m-	0.00E+00	3.43E-12
IND1	resident_adult	LOAD4	Acrylonitrile	8.17E-10	3.38E-06
IND1	resident_adult	LOAD4	Aniline	1.63E-14	3.07E-08
IND1	resident_adult	LOAD4	Benzene	5.22E-12	7.14E-09
IND1	resident_adult	LOAD4	Carbon tetrachloride	2.11E-12	4.70E-08
IND1	resident_adult	LOAD4	Chloroform (Trichloromethane)	6.26E-12	7.73E-08
IND1	resident_adult	LOAD4	Dichlorobenzene,1,4-	9.99E-16	3.53E-13
IND1	resident_adult	LOAD4	Dichloroethane 1,1-	1.72E-12	4.94E-09
IND1	resident_adult	LOAD4	Dichloroethane, 1,2- (Ethylene Dichloride)	1.26E-11	1.42E-07
IND1	resident_adult	LOAD4	Dichloroethylene 1,1-	0.00E+00	1.25E-07
IND1	resident_adult	LOAD4	Dioxane, 1,4-	2.15E-10	0.00E+00
IND1	resident_adult	LOAD4	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	2.00E-11	2.10E-06
IND1	resident_adult	LOAD4	Ethylbenzene	0.00E+00	7.01E-12
IND1	resident_adult	LOAD4	Ethylene Dibromide	1.50E-12	2.68E-07
IND1	resident_adult	LOAD4	Formaldehyde	5.54E-08	7.22E-03
IND1	resident_adult	LOAD4	Methylene chloride	1.06E-14	8.57E-12
IND1	resident_adult	LOAD4	Tetrachloroethylene (Perchloroethylene)	1.03E-14	1.15E-10
IND1	resident_adult	LOAD4	Toluene	0.00E+00	2.07E-07
IND1	resident_adult	LOAD4	Trichloroethane, 1,1,1-	0.00E+00	4.20E-12
IND1	resident_adult	LOAD4	Trichloroethylene	9.94E-14	5.54E-09
IND1	resident_adult	LOAD4	Vinyl Chloride	3.61E-09	0.00E+00
IND1	resident_adult	LOAD4	Xylene, m-	0.00E+00	4.72E-12
IND1	resident_adult	OILHTR	Acetaldehyde	6.32E-11	6.35E-04
IND1	resident_adult	OILHTR	Acrolein	0.00E+00	2.24E-03
IND1	resident_adult	OILHTR	Benzene	1.18E-09	1.61E-06

IND1	resident_adult	OILHTR	Benzo(a)pyrene	2.98E-09	0.00E+00
IND1	resident_adult	OILHTR	Ethylbenzene	0.00E+00	1.16E-07
IND1	resident_adult	OILHTR	Formaldehyde	5.25E-10	6.83E-05
IND1	resident_adult	OILHTR	Naphthalene	7.33E-11	5.33E-08
IND1	resident_adult	OILHTR	Toluene	0.00E+00	1.10E-06
IND1	resident_adult	OILHTR	Xylene, m-	0.00E+00	4.72E-08
IND1	resident_adult	OILTREAT	Benzene	3.59E-06	4.91E-03
IND1	resident_adult	OILTREAT	Ethylbenzene	0.00E+00	1.41E-04
IND1	resident_adult	OILTREAT	Methylene chloride	8.48E-08	6.88E-05
IND1	resident_adult	OILTREAT	Tetrachloroethylene (Perchloroethylene)	6.69E-07	7.45E-03
IND1	resident_adult	OILTREAT	Toluene	0.00E+00	1.99E-03
IND1	resident_adult	OILTREAT	Trichloroethane, 1,1,1-	0.00E+00	2.94E-04
IND1	resident_adult	OILTREAT	Trichloroethylene	1.09E-08	6.09E-04
IND1	resident_adult	OILTREAT	Xylene, m-	0.00E+00	8.02E-05
IND1	resident_adult	PRESS	Benzene	2.20E-08	3.01E-05
IND1	resident_adult	PRESS	Ethylbenzene	0.00E+00	1.06E-06
IND1	resident_adult	PRESS	Methylene chloride	1.01E-09	8.19E-07
IND1	resident_adult	PRESS	Tetrachloroethylene (Perchloroethylene)	5.80E-09	6.46E-05
IND1	resident_adult	PRESS	Toluene	0.00E+00	3.22E-05
IND1	resident_adult	PRESS	Trichloroethane, 1,1,1-	0.00E+00	2.32E-06
IND1	resident_adult	PRESS	Trichloroethylene	1.92E-10	1.07E-05
IND1	resident_adult	PRESS	Xylene, m-	0.00E+00	7.42E-07
IND1	resident_adult	RRLOAD1	Acrylonitrile	1.54E-09	6.36E-06
IND1	resident_adult	RRLOAD1	Aniline	3.06E-14	5.76E-08
IND1	resident_adult	RRLOAD1	Benzene	9.78E-12	1.34E-08
IND1	resident_adult	RRLOAD1	Benzo(a)pyrene	2.92E-07	0.00E+00
IND1	resident_adult	RRLOAD1	Carbon tetrachloride	3.96E-12	8.82E-08
IND1	resident_adult	RRLOAD1	Chloroform (Trichloromethane)	1.17E-11	1.45E-07
IND1	resident_adult	RRLOAD1	Dichlorobenzene,1,4-	1.87E-15	6.61E-13
IND1	resident_adult	RRLOAD1	Dichloroethane 1,1-	3.22E-12	9.27E-09
IND1	resident_adult	RRLOAD1	Dichloroethane, 1,2- (Ethylene Dichloride)	2.36E-11	2.66E-07
IND1	resident_adult	RRLOAD1	Dichloroethylene 1,1-	0.00E+00	2.34E-07
IND1	resident_adult	RRLOAD1	Dioxane, 1,4-	4.02E-10	0.00E+00
IND1	resident_adult	RRLOAD1	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	3.74E-11	3.92E-06
IND1	resident_adult	RRLOAD1	Ethylbenzene	0.00E+00	1.31E-11
IND1	resident_adult	RRLOAD1	Ethylene Dibromide	2.81E-12	5.03E-07
IND1	resident_adult	RRLOAD1	Formaldehyde	1.04E-07	1.36E-02
IND1	resident_adult	RRLOAD1	Methylene chloride	1.98E-14	1.61E-11
IND1	resident_adult	RRLOAD1	Tetrachloroethylene (Perchloroethylene)	1.93E-14	2.15E-10
IND1	resident_adult	RRLOAD1	Toluene	0.00E+00	3.88E-07
IND1	resident_adult	RRLOAD1	Trichloroethane, 1,1,1-	0.00E+00	7.87E-12
IND1	resident_adult	RRLOAD1	Trichloroethylene	1.86E-13	1.04E-08
IND1	resident_adult	RRLOAD1	Vinyl Chloride	6.77E-09	0.00E+00
IND1	resident_adult	RRLOAD1	Xylene, m-	0.00E+00	8.84E-12
IND1	resident_adult	RRLOAD2	Acrylonitrile	2.17E-09	8.97E-06
IND1	resident_adult	RRLOAD2	Aniline	4.31E-14	8.12E-08
IND1	resident_adult	RRLOAD2	Benzene	2.55E-09	3.49E-06
IND1	resident_adult	RRLOAD2	Carbon tetrachloride	5.59E-12	1.24E-07
IND1	resident_adult	RRLOAD2	Chloroform (Trichloromethane)	1.65E-11	2.04E-07
IND1	resident_adult	RRLOAD2	Dichlorobenzene,1,4-	2.63E-15	9.32E-13
IND1	resident_adult	RRLOAD2	Dichloroethane 1,1-	4.55E-12	1.31E-08
IND1	resident_adult	RRLOAD2	Dichloroethane, 1,2- (Ethylene Dichloride)	3.33E-11	3.76E-07
IND1	resident_adult	RRLOAD2	Dichloroethylene 1,1-	0.00E+00	3.30E-07
IND1	resident_adult	RRLOAD2	Dioxane, 1,4-	5.67E-10	0.00E+00
IND1	resident_adult	RRLOAD2	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	5.27E-11	5.53E-06
IND1	resident_adult	RRLOAD2	Ethylbenzene	0.00E+00	8.59E-08
IND1	resident_adult	RRLOAD2	Ethylene Dibromide	3.96E-12	7.09E-07

IND1	**resident_adult**	**RRLOAD2**	Formaldehyde	1.47E-07	1.91E-02
IND1	**resident_adult**	**RRLOAD2**	Methylene chloride	2.14E-10	1.74E-07
IND1	**resident_adult**	**RRLOAD2**	Tetrachloroethylene (Perchloroethylene)	2.11E-10	2.35E-06
IND1	**resident_adult**	**RRLOAD2**	Toluene	0.00E+00	3.76E-06
IND1	**resident_adult**	**RRLOAD2**	Trichloroethane, 1,1,1-	0.00E+00	8.56E-08
IND1	**resident_adult**	**RRLOAD2**	Trichloroethylene	1.23E-11	6.87E-07
IND1	**resident_adult**	**RRLOAD2**	Vinyl Chloride	9.54E-09	0.00E+00
IND1	**resident_adult**	**RRLOAD2**	Xylene, m-	0.00E+00	9.08E-08
IND1	**resident_adult**	**RRLOAD3**	Acrylonitrile	8.85E-10	3.66E-06
IND1	**resident_adult**	**RRLOAD3**	Aniline	1.76E-14	3.32E-08
IND1	**resident_adult**	**RRLOAD3**	Benzene	1.04E-09	1.43E-06
IND1	**resident_adult**	**RRLOAD3**	Carbon tetrachloride	2.28E-12	5.08E-08
IND1	**resident_adult**	**RRLOAD3**	Chloroform (Trichloromethane)	6.75E-12	8.33E-08
IND1	**resident_adult**	**RRLOAD3**	Dichlorobenzene,1,4-	1.08E-15	3.81E-13
IND1	**resident_adult**	**RRLOAD3**	Dichloroethane 1,1-	1.86E-12	5.34E-09
IND1	**resident_adult**	**RRLOAD3**	Dichloroethane, 1,2- (Ethylene Dichloride)	1.36E-11	1.54E-07
IND1	**resident_adult**	**RRLOAD3**	Dichloroethylene 1,1-	0.00E+00	1.35E-07
IND1	**resident_adult**	**RRLOAD3**	Dioxane, 1,4-	2.32E-10	0.00E+00
IND1	**resident_adult**	**RRLOAD3**	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	2.15E-11	2.26E-06
IND1	**resident_adult**	**RRLOAD3**	Ethylbenzene	0.00E+00	3.51E-08
IND1	**resident_adult**	**RRLOAD3**	Ethylene Dibromide	1.62E-12	2.90E-07
IND1	**resident_adult**	**RRLOAD3**	Formaldehyde	6.00E-08	7.81E-03
IND1	**resident_adult**	**RRLOAD3**	Methylene chloride	8.75E-11	7.11E-08
IND1	**resident_adult**	**RRLOAD3**	Tetrachloroethylene (Perchloroethylene)	8.61E-11	9.58E-07
IND1	**resident_adult**	**RRLOAD3**	Toluene	0.00E+00	1.54E-06
IND1	**resident_adult**	**RRLOAD3**	Trichloroethane, 1,1,1-	0.00E+00	3.50E-08
IND1	**resident_adult**	**RRLOAD3**	Trichloroethylene	5.03E-12	2.80E-07
IND1	**resident_adult**	**RRLOAD3**	Vinyl Chloride	3.90E-09	0.00E+00
IND1	**resident_adult**	**RRLOAD3**	Xylene, m-	0.00E+00	3.71E-08
IND1	**resident_adult**	**WWTS**	Benzene	2.00E-10	2.74E-07
IND1	**resident_adult**	**WWTS**	Ethylbenzene	0.00E+00	6.78E-09
IND1	**resident_adult**	**WWTS**	Methylene chloride	1.69E-11	1.37E-08
IND1	**resident_adult**	**WWTS**	Tetrachloroethylene (Perchloroethylene)	1.66E-11	1.84E-07
IND1	**resident_adult**	**WWTS**	Toluene	0.00E+00	2.53E-07
IND1	**resident_adult**	**WWTS**	Trichloroethane, 1,1,1-	0.00E+00	6.75E-09
IND1	**resident_adult**	**WWTS**	Trichloroethylene	9.49E-13	5.29E-08
IND1	**resident_adult**	**WWTS**	Xylene, m-	0.00E+00	7.15E-09
Receptor	Population	Source	COPC	Cancer	
RES2	**resident_adult**	**BOILER1**	Acetaldehyde	2.07E-12	
RES2	**resident_adult**	**BOILER1**	Acrolein	0.00E+00	
RES2	**resident_adult**	**BOILER1**	Benzene	3.85E-11	
RES2	**resident_adult**	**BOILER1**	Benzo(a)pyrene	6.91E-11	
RES2	**resident_adult**	**BOILER1**	Ethylbenzene	0.00E+00	
RES2	**resident_adult**	**BOILER1**	Formaldehyde	1.72E-11	
RES2	**resident_adult**	**BOILER1**	Naphthalene	1.73E-12	
RES2	**resident_adult**	**BOILER1**	Toluene	0.00E+00	
RES2	**resident_adult**	**BOILER1**	Xylene, m-	0.00E+00	
RES2	**resident_adult**	**BOILER2**	Acetaldehyde	2.10E-12	
RES2	**resident_adult**	**BOILER2**	Acrolein	0.00E+00	
RES2	**resident_adult**	**BOILER2**	Benzene	3.90E-11	
RES2	**resident_adult**	**BOILER2**	Benzo(a)pyrene	7.01E-11	
RES2	**resident_adult**	**BOILER2**	Ethylbenzene	0.00E+00	
RES2	**resident_adult**	**BOILER2**	Formaldehyde	1.74E-11	
RES2	**resident_adult**	**BOILER2**	Naphthalene	1.76E-12	
RES2	**resident_adult**	**BOILER2**	Toluene	0.00E+00	
RES2	**resident_adult**	**BOILER2**	Xylene, m-	0.00E+00	
RES2	**resident_adult**	**BUGEN**	Acetaldehyde	6.17E-11	

RES2	resident_adult	BUGEN	Acrolein	0.00E+00	
RES2	resident_adult	BUGEN	Arsenic	1.52E-10	
RES2	resident_adult	BUGEN	Benzene	1.47E-10	
RES2	resident_adult	BUGEN	Cadmium	1.77E-10	
RES2	resident_adult	BUGEN	Chromium, hexavalent	4.02E-10	
RES2	resident_adult	BUGEN	Ethylbenzene	0.00E+00	
RES2	resident_adult	BUGEN	Formaldehyde	2.85E-10	
RES2	resident_adult	BUGEN	Hydrogen chloride	0.00E+00	
RES2	resident_adult	BUGEN	Lead	2.91E-12	
RES2	resident_adult	BUGEN	Mercury	0.00E+00	
RES2	resident_adult	BUGEN	Naphthalene	1.86E-11	
RES2	resident_adult	BUGEN	Nickel	2.79E-11	
RES2	resident_adult	BUGEN	Selenium	0.00E+00	
RES2	resident_adult	BUGEN	Toluene	0.00E+00	
RES2	resident_adult	BUGEN	Xylene, m-	0.00E+00	
RES2	resident_adult	DAF	Benzene	2.63E-10	
RES2	resident_adult	DAF	Ethylbenzene	0.00E+00	
RES2	resident_adult	DAF	Methylene chloride	1.20E-11	
RES2	resident_adult	DAF	Tetrachloroethylene (Perchloroethylene)	6.98E-11	
RES2	resident_adult	DAF	Toluene	0.00E+00	
RES2	resident_adult	DAF	Trichloroethane, 1,1,1-	0.00E+00	
RES2	resident_adult	DAF	Trichloroethylene	2.30E-12	
RES2	resident_adult	DAF	Xylene, m-	0.00E+00	
RES2	resident_adult	DRUMN	Acrylonitrile	7.87E-09	
RES2	resident_adult	DRUMN	Aniline	1.30E-12	
RES2	resident_adult	DRUMN	Benzene	4.48E-09	
RES2	resident_adult	DRUMN	Carbon tetrachloride	3.42E-09	
RES2	resident_adult	DRUMN	Chlorine	0.00E+00	
RES2	resident_adult	DRUMN	Chloroform (Trichloromethane)	2.69E-09	
RES2	resident_adult	DRUMN	Dichlorobenzene,1,4-	5.64E-11	
RES2	resident_adult	DRUMN	Dichloroethane 1,1-	7.90E-10	
RES2	resident_adult	DRUMN	Dichloroethane, 1,2- (Ethylene Dichloride)	3.48E-09	
RES2	resident_adult	DRUMN	Dichloroethylene 1,1-	0.00E+00	
RES2	resident_adult	DRUMN	Dioxane, 1,4-	5.37E-10	
RES2	resident_adult	DRUMN	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	7.31E-10	
RES2	resident_adult	DRUMN	Ethylbenzene	0.00E+00	
RES2	resident_adult	DRUMN	Ethylene Dibromide	3.16E-09	
RES2	resident_adult	DRUMN	Formaldehyde	9.35E-11	
RES2	resident_adult	DRUMN	Toluene	0.00E+00	
RES2	resident_adult	DRUMN	Trichloroethylene	3.76E-10	
RES2	resident_adult	DRUMN	Vinyl Chloride	2.50E-09	
RES2	resident_adult	DRUMN	Xylene, m-	0.00E+00	
RES2	resident_adult	DRUMS	Acrylonitrile	9.58E-08	
RES2	resident_adult	DRUMS	Aniline	1.58E-11	
RES2	resident_adult	DRUMS	Benzene	5.46E-08	
RES2	resident_adult	DRUMS	Carbon tetrachloride	4.16E-08	
RES2	resident_adult	DRUMS	Chlorine	0.00E+00	
RES2	resident_adult	DRUMS	Chloroform (Trichloromethane)	3.27E-08	
RES2	resident_adult	DRUMS	Dichlorobenzene,1,4-	6.86E-10	
RES2	resident_adult	DRUMS	Dichloroethane 1,1-	9.61E-09	
RES2	resident_adult	DRUMS	Dichloroethane, 1,2- (Ethylene Dichloride)	4.24E-08	
RES2	resident_adult	DRUMS	Dichloroethylene 1,1-	0.00E+00	
RES2	resident_adult	DRUMS	Dioxane, 1,4-	6.53E-09	
RES2	resident_adult	DRUMS	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	8.90E-09	
RES2	resident_adult	DRUMS	Ethylbenzene	0.00E+00	
RES2	resident_adult	DRUMS	Ethylene Dibromide	3.85E-08	
RES2	resident_adult	DRUMS	Formaldehyde	1.14E-09	

RES2	resident_adult	DRUMS	Toluene	0.00E+00	
RES2	resident_adult	DRUMS	Trichloroethylene	4.57E-09	
RES2	resident_adult	DRUMS	Vinyl Chloride	3.04E-08	
RES2	resident_adult	DRUMS	Xylene, m-	0.00E+00	
RES2	resident_adult	FUELBLND	Acrylonitrile	5.12E-09	
RES2	resident_adult	FUELBLND	Aniline	6.61E-13	
RES2	resident_adult	FUELBLND	Benzene	2.18E-09	
RES2	resident_adult	FUELBLND	Carbon tetrachloride	1.53E-09	
RES2	resident_adult	FUELBLND	Chloroform (Trichloromethane)	1.31E-09	
RES2	resident_adult	FUELBLND	Dichlorobenzene,1,4-	2.73E-11	
RES2	resident_adult	FUELBLND	Dichloroethane 1,1-	3.86E-10	
RES2	resident_adult	FUELBLND	Dichloroethane, 1,2- (Ethylene Dichloride)	1.72E-09	
RES2	resident_adult	FUELBLND	Dichloroethylene 1,1-	0.00E+00	
RES2	resident_adult	FUELBLND	Dioxane, 1,4-	6.86E-10	
RES2	resident_adult	FUELBLND	Epichlorohydrin (1-Chloro-2,3- epoxypropane)	3.93E-10	
RES2	resident_adult	FUELBLND	Ethylbenzene	0.00E+00	
RES2	resident_adult	FUELBLND	Ethylene Dibromide	1.54E-09	
RES2	resident_adult	FUELBLND	Formaldehyde	1.10E-07	
RES2	resident_adult	FUELBLND	Toluene	0.00E+00	
RES2	resident_adult	FUELBLND	Trichloroethylene	1.84E-10	
RES2	resident_adult	FUELBLND	Vinyl Chloride	8.26E-09	
RES2	resident_adult	FUELBLND	Xylene, m-	0.00E+00	
RES2	resident_adult	FUG1	Benzene	5.41E-08	
RES2	resident_adult	FUG1	Ethylbenzene	0.00E+00	
RES2	resident_adult	FUG1	Methylene chloride	2.48E-09	
RES2	resident_adult	FUG1	Tetrachloroethylene (Perchloroethylene)	8.23E-09	
RES2	resident_adult	FUG1	Toluene	0.00E+00	
RES2	resident_adult	FUG1	Trichloroethane, 1,1,1-	0.00E+00	
RES2	resident_adult	FUG1	Trichloroethylene	2.67E-10	
RES2	resident_adult	FUG1	Xylene, m-	0.00E+00	
RES2	resident_adult	FUG2	Benzene	7.47E-10	
RES2	resident_adult	FUG2	Ethylbenzene	0.00E+00	
RES2	resident_adult	FUG2	Methylene chloride	5.37E-11	
RES2	resident_adult	FUG2	Tetrachloroethylene (Perchloroethylene)	1.46E-10	
RES2	resident_adult	FUG2	Toluene	0.00E+00	
RES2	resident_adult	FUG2	Trichloroethane, 1,1,1-	0.00E+00	
RES2	resident_adult	FUG2	Trichloroethylene	2.43E-12	
RES2	resident_adult	FUG2	Xylene, m-	0.00E+00	
RES2	resident_adult	FUG3	Benzene	9.74E-11	
RES2	resident_adult	FUG3	Ethylbenzene	0.00E+00	
RES2	resident_adult	FUG3	Methylene chloride	7.12E-12	
RES2	resident_adult	FUG3	Tetrachloroethylene (Perchloroethylene)	1.82E-11	
RES2	resident_adult	FUG3	Toluene	0.00E+00	
RES2	resident_adult	FUG3	Trichloroethane, 1,1,1-	0.00E+00	
RES2	resident_adult	FUG3	Trichloroethylene	3.11E-13	
RES2	resident_adult	FUG3	Xylene, m-	0.00E+00	
RES2	resident_adult	H1	Acetaldehyde	3.20E-12	
RES2	resident_adult	H1	Acrolein	0.00E+00	
RES2	resident_adult	H1	Benzene	5.96E-11	
RES2	resident_adult	H1	Benzo(a)pyrene	1.07E-10	
RES2	resident_adult	H1	Ethylbenzene	0.00E+00	
RES2	resident_adult	H1	Formaldehyde	2.65E-11	
RES2	resident_adult	H1	Naphthalene	2.68E-12	
RES2	resident_adult	H1	Toluene	0.00E+00	
RES2	resident_adult	H1	Xylene, m-	0.00E+00	
RES2	resident_adult	H2	Acetaldehyde	3.19E-12	
RES2	resident_adult	H2	Acrolein	0.00E+00	