# ADDENDUM

# HUMAN HEALTH RISK ASSESSMENT
# AND ECOLOGICAL RISK ASSESSMENT
# FOR ROMIC'S EAST PALO ALTO FACILITY

Prepared for

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September 23, 2003

03-6719F

# TABLE OF CONTENTS

## TABLES



## FIGURES



## APPENDICES

# ACRONYMS

| | |
|---|---|
| BAAQMD | Bay Area Air Quality Management District |
| BACT | Best Available Control Technology |
| CalEPA | California Environmental Protection Agency |
| CSF | Cancer Slope Factor |
| DTSC | Department of Toxic Substances Control |
| HI | Hazard Index |
| HQ | Hazard Quotient |
| HRA | Health Risk Assessment |
| LPG | Liquefied Petroleum Gas |
| NCP | National Contingency Plan |
| OVA | Organic Vapor Analyzer |
| RCRA | Resource Conservation and Recovery Act |
| RfD | Reference Dose |
| RME | Reasonable Maximum Exposure |
| USEPA | United States Environmental Protection Agency |
| VOC | Volatile Organic Compound |

| | |
|---|---|
| cfm | cubic feet per minute |
| ft | feet |
| g | gram |
| kg | kilogram |
| µg | microgram |
| lb | pound |
| mg | milligram |
| $m^3$ | cubic meter |
| s | second |

# EXECUTIVE SUMMARY

Romic operates a commercial hazardous waste recycling facility ("Site") in East Palo Alto, California. The main operations at the Site consist of recycling waste solvents to produce reusable solvents, blending wastes to produce fuel-grade materials, recycling antifreeze, and treating industrial wastewater. As part of the Department of Toxic Substances Control (DTSC) evaluation of the Resource Conservation and Recovery Act (RCRA) Part B permit renewal/modification for the Site, Romic volunteered to prepare a health risk assessment (HRA). A HRA was submitted on February 19, 2001 (hereafter referred to as the 2001 HRA). The 2001 HRA presented the methodology and results of the human health and ecological risk assessments based on analysis of the emissions from operations at the Site.

The Site has updated its RCRA Part B Permit Application (originally dated November 2001) since the submittal of the 2001 HRA. A comparison between the potential emission sources addressed in the 2001 HRA and the potential emission sources discussed in the updated RCRA Part B Permit Application show that there were several tanks and operations whose descriptions had been updated. In addition, there were some sources and tanks added to or removed from the RCRA Part B Permit Application.

This addendum presents a description of each source of emissions whose specification has been modified from that presented in the 2001 HRA. An analysis, either qualitative or quantitative, is presented of the potential change in each source's emissions and of the potential health impact of these changes on the surrounding community. Each revised or new potential source of emissions was evaluated using the following two steps.

In the first step, it was determined whether it was likely that the emissions from the source, as presented in the 2001 HRA, were likely to change as a result of the revision to the source as described in the updated RCRA Part B Permit Application. If a change was likely, then various techniques were used to estimate the revised emissions. These emissions techniques include use of engineering judgment, facility operational information, and United States Environmental Protection Agency (USEPA)-approved emissions factors and estimating tools. If the source was new, then its emissions were estimated using either analyses presented in the 2001 HRA for similar sources, or new information specific to the source. The fractional increase in emissions was calculated for each source group.

The second step was to evaluate whether changes in the estimated emissions from the source would likely result in a significant increase on the health impacts estimated from the Site as a whole, as presented in the 2001 HRA. This evaluation has been divided into three parts. In the first part, the potential cancer risks and noncancer hazard indices (HIs) due to metals emissions from the baghouse are evaluated. This source is evaluated separately as metals emissions were not included in the 2001 HRA. In the second part, potential changes in the estimated cancer risks and noncancer HIs due to volatile organic compound (VOC) emissions from the revised sources are evaluated. These changes are quantitatively addressed for the maximum exposed residential and worker receptor locations as identified in the 2001 HRA. It should be noted that due to changes in emission rates that resulted from the updated RCRA Part B Permit Application, the maximum exposed resident and worker receptors as identified in the 2001 HRA may no longer represent the maximally exposed individual. As a result, in the third part of this evaluation, a screening evaluation is conducted to provide an upper-bound estimate of the possible off-site health impacts at any residential or worker receptor location near the Site, regardless of location.

The results of this evaluation show that:

- The estimated reasonable maximum exposure (RME) cancer risks based on potential exposures to metals emissions from the baghouse are less than $1 \times 10^{-8}$ and the noncancer HIs are less than one for both the maximum residential and worker receptors.
- The estimated RME cancer risk for a resident at the maximum location as identified in the 2001 HRA is $2.5 \times 10^{-6}$. This estimated risk has decreased approximately 21% based on the source revisions discussed in this addendum. No individual chemical has an estimated risk of greater than $1 \times 10^{-6}$. The estimated chronic HI for a resident at this location is less than 1.
- The estimated RME cancer risk for a worker at this location is $5.0 \times 10^{-6}$. This estimated risk has decreased approximately 28% based on the source revisions discussed in this addendum. Two chemicals have an estimated risk of greater than $1 \times 10^{-6}$, gasoline ($1.2 \times 10^{-6}$) and benzene ($1.1 \times 10^{-6}$). The estimated chronic HI for a worker at this location is less than 1.

A sensitivity analysis was conducted along the perimeter edge of the 2001 HRA isopleth representing a risk level of 10 in a million ($1 \times 10^{-5}$) for a residential receptor. (As noted in the 2001 HRA, there were no actual residents located within this isopleth.) Each evaluated point showed that the risks were reduced as a result of the revisions discussed in this HRA Addendum. Although the isopleth location may change somewhat as a result of these revisions, the changes have reduced the overall risks along the isopleth. As a result, we would expect the updated isopleth representing the $1 \times 10^{-5}$ risk level to be slightly smaller than that presented in the 2001 HRA.

The total Site VOC emissions presented in this addendum represent a reduction compared to the 2001 HRA. The total Site VOC emissions in this addendum are 17.46 tons per year as compared to 19.83 tons per year in the 2001 HRA. This represents a net reduction in VOC emissions of 2.37 tons per year or approximately 12%.

As discussed in Section 9.0 (Ecological Assessment) of the 2001 HRA, volatile emissions from the facility are not expected to be a significant source of exposure for ecological receptors in the vicinity of the Site. In addition, potential metals deposition on surrounding soil from the proposed baghouse is estimated to be well below naturally occurring levels of metals in soil.

Based on the results of this addendum, no significant changes are expected to the conclusions of the 2001 HRA.

# 1.0 INTRODUCTION

Romic operates a commercial hazardous waste recycling facility ("Site") in East Palo Alto, California. The main operations at the Site consist of recycling waste solvents to produce reusable solvents, blending wastes to produce fuel-grade materials, recycling antifreeze, and treating industrial wastewater. As part of the Department of Toxic Substances Control (DTSC) evaluation of the Resource Conservation and Recovery Act (RCRA) Part B permit renewal/modification for the Site, Romic volunteered to prepare a health risk assessment (HRA). A HRA was submitted on February 19, 2001 (hereafter referred to as the 2001 HRA). The 2001 HRA presented the methodology and results of the human health and ecological risk assessments based on analysis of the emissions from operations at the Site.

The Site has updated its RCRA Part B Permit Application (originally dated November 2001) since the submittal of the 2001 HRA. This addendum to the 2001 HRA addresses the operational changes proposed in the application with respect to the potential change in emissions from these operations, as represented in the 2001 HRA.

This addendum presents a description of each source of emissions whose specification has been modified from that presented in the 2001 HRA. An analysis, either qualitative or quantitative, is presented of the potential change in each source's emissions and of the potential health impact of these changes on the surrounding community.

## 1.1 SOURCES ADDRESSED IN ADDENDUM

A comparison between the potential emission sources addressed in the 2001 HRA and the potential emission sources discussed in the updated RCRA Part B Permit Application show that there were several tanks and operations whose descriptions had been updated. In addition, there were some sources and tanks added to or removed from the RCRA Part B Permit Application. Figure 1 indicates the locations of new, revised, and removed source groups at the Site. These source changes are briefly discussed below and evaluated in detail in the remainder of this addendum.

**Tanks**

The specifications of several tanks have been revised. These tanks changes are summarized in Table 1. In addition, there are 35 tanks that have a small difference in the volume specified in the updated RCRA Part B Permit Application versus the 2001 HRA (difference of less than 10%). These tank changes are summarized in Table 2.

**Drum Storage and Sampling and Roll-off Bins**

The storage capacities in five drum storage areas and in the drum sampling area were also revised in the updated RCRA Part B Permit Application. These revisions are summarized in Table 3. In addition, the use of roll-off bins at the Site was included in the updated RCRA Part B Application.

**New Operations**

There were three new operations included in the updated RCRA Part B Permit Application. These operations were not addressed in the 2001 HRA. These new operations are:

- Inorganic waste treatment system,
- Debris shredding, and
- Aerosol depressurization.

**Revised Operations**

The analysis of the drum liquefaction operation in the 2001 HRA did not include consideration of the use of a light solvent in the drum cleaning operations. In this addendum, the methodology used to estimate the emissions from this source is reviewed and revised to be consistent with the description presented in the updated RCRA Part B Permit Application. This addendum also presents a review of how the proposed change to the solid waste consolidation operation affects the estimated ambient air impacts that could result from emissions from this source.

## 1.2 GENERAL APPROACH

Each revised or new potential source of emissions discussed in Section 1.1 was evaluated using the following two steps.

First, it was determined whether it was likely that the emissions from the source, as presented in the 2001 HRA, were likely to change as a result of the revision to the source as described in the updated RCRA Part B Permit Application. If a change was likely, then various techniques were used to estimate the revised emissions. These emissions techniques include use of engineering judgment, facility operational information, and the United States Environmental Protection Agency (USEPA)-approved emissions factors and estimating tools. These are further discussed in this addendum. If the source was new, then its emissions were estimated using either analyses presented in the 2001 HRA for similar sources, or new information specific to the source. The fractional increase in emissions was calculated for each source group.

The second step was to evaluate whether changes in the estimated emissions from the source would likely result in a significant increase on the health impacts estimated from the Site as a whole, as presented in the 2001 HRA. As a conservative screening level evaluation of the revised maximum health impacts, the maximum fractional increase in source group emissions was applied to the health impacts presented in the 2001 HRA for the maximum exposed residential and worker receptors. If the potential change of health impacts at these receptors did not appear to be significant and if the parameters describing the physical source of emissions (and therefore their tendency to mix in the air) had not changed significantly, then it was concluded that the revisions to the updated RCRA Part B Permit Application would not significantly change the conclusions of the 2001 HRA.

## 1.3 ORGANIZATION OF ADDENDUM

This addendum is divided into six sections as follows:

**Section 1.0 – Introduction:** describes the purpose and scope of the HRA Addendum and outlines the report organization.

**Section 2.0 – Description of New and Revised Sources of Emissions:** presents a description of new and revised potential sources of emissions, as presented in the updated RCRA Part B Permit Application

**Section 3.0 – Evaluation of Emissions and Potential Off-Site Impacts:** presents the qualitative or quantitative (as appropriate for the particular source) analysis used to evaluate the potential changes in emissions from the source, as compared to the estimates presented in the 2001 HRA. This section also presents the evaluation of the potential change to the off-site ambient impacts from this source, as compared to those presented in the 2001 HRA.

**Section 4.0 – Evaluation of Changes to Potential Off-Site Health Impacts:** presents the results of the screening level analysis of the effects of the new and revised sources on the off-site health impacts presented in the 2001 HRA. This section also presents a more refined analysis of the revised health impacts for the maximum exposed residential and worker receptors identified in the 2001 HRA.

**Section 5.0 – Conclusions:** summarizes the results of the HRA Addendum and provides conclusions regarding the potential for adverse health risks due to emissions from the Site.

**Section 6.0 – References:** provides the references cited in this addendum.

Supporting documentation is presented in the appendices to this addendum. Appendix A presents the ISC3 input files for the inorganic waste stabilization. Appendix B presents the SCREEN3 results for the solids consolidation. Appendix C presents the SCREEN3 results for the aerosol can depressurization. Appendix D presents the updated response to comments received from DTSC on the 2001 HRA.

# 2.0 DESCRIPTION OF NEW AND REVISED SOURCES OF EMISSIONS

This section of the addendum contains a description of the new and revised sources of emissions. The potential emissions are categorized by type of source.

## 2.1 TANKS

Tanks are used at the Site to store both liquid organic and inorganic waste, as well as intermediate and final refined product. Emissions can result from both breathing losses (due to fluctuations in diurnal temperatures) and working losses (resulting from displacement of vapor in vapor space during filling). The Site proposed two new tanks, the removal of one tank, and revised specifications for 47 tanks in the updated RCRA Part B Permit Application, as compared to the information used in the preparation of the 2001 HRA. As further discussed in Section 3.0, tanks considered in this addendum were evaluated either qualitatively or quantitatively, depending on the magnitude and nature of the revision.

## 2.2 DRUM STORAGE

Drums are located in storage areas and sampling areas. Small amounts of fugitive emissions from storage drums can result from leaking of volatile organic chemicals (VOCs) from sealed bungholes. The updated RCRA Part B Permit Application revised the proposed storage capacity of the five drum storage areas at the Site and one drum sampling area; the overall maximum drum storage on-site increased by approximately 7% (see Table 3). This addendum evaluated the change in emissions from each storage area as compared to those used in the 2001 HRA analyses.

## 2.3 INORGANIC WASTE TREATMENT SYSTEM

Waste streams handled at the proposed inorganic waste treatment system would be acidic and/or alkaline aqueous wastes. Chemical precipitation would be used to assist in the separation of metal compounds in the waste. Insoluble precipitates formed by application of precipitating agents (typically hydroxide compounds) would be removed through settling, decanting, and filtration in the form of a sludge. This sludge would then be put through a filter press to remove excess water and concentrate the solids. The compressed solids (also called filter cake) would be removed from the filter press and sent for off-site landfill disposal. Prior to off-site disposal, the filter cake could require stabilization to meet regulatory or disposal facility specifications.

Stabilization would be achieved by the addition of a pozzolanic[1] material, such as cement kiln dust. As described in the Site's updated RCRA Part B Permit Application, the pozzolanic material could be added directly to the roll-off box containing the filter cake and mixed in place. This activity could generate fugitive dust consisting of the pozzolanic material. The Site has proposed to undertake stabilization activities within an enclosure and vent the air within the enclosure, including any fugitive dust, through a baghouse (fabric filter system).

[1] Pozzolanic material is finely divided siliceous or siliceous and aluminous material that reacts chemically with slaked lime at ordinary temperature and in the presence of moisture to form a strong slow-hardening cement.

## 2.4 DEBRIS SHREDDING

The Site has a debris shredding system that is used to reduce the size of solid materials brought on-site for consolidation, processing, and/or transfer to off-site disposal. The shredding system consists of three shredders in series. Material is brought to the shredding system in bins and fed to the first shredder. The three shredders successively reduce the size of the material to a final size of approximately ½ inch. Shredded material is collected from the third shredder in a bin and either transported off-site for final disposal or consolidated with other material for off-site disposal. The potential for emissions from this unit is evaluated in this addendum.

## 2.5 AEROSOL CAN DEPRESSURIZATION

The Site has proposed the addition of an aerosol can depressurization system. This system will remove propellant and container contents from waste aerosol cans. Although this unit does not have a final design, the Site had proposed that the maximum throughput rate for the system would be 20 cans per minute. The cans would be put through the system in batches and the system would equilibrate prior to the next batch.

The system, as described in the updated RCRA Part B Permit Application, would consist of an airtight vacuum chamber, a vacuum pump, and a collection vessel. The depressurization chamber would be maintained under negative pressure. An aerosol can would be depressurized by puncturing it and removing the can contents by negative vacuum to a condenser. Collected vapors would be condensed into liquids, which would then be recycled or disposed of off-site. The system would be fitted with a carbon absorption system for the control of propellants that would not be condensed. The carbon absorption system would have a control efficiency of at least 95% (a typical value for this type of system, according to Site personnel). The potential for emissions from this unit is evaluated in this addendum.

## 2.6 DRUM LIQUEFACTION

Drum liquefaction is a process in which sludges and other residual materials are cleaned out of drums so that the drums can be classified as "empty". Containers are opened and placed in a drum cleaning machine. The drums are emptied and cleaned out by rotating blades that scrape out any material within the drums. This cleaning process is aided by the injection of a solvent. This solvent is part of the stream recovered by on-site distillation processes. The drum is then cleaned by brushing action, assisted by the injection of diesel, with a final diesel rinse before leaving the unit clean and empty. This system is serviced by a vapor recovery system that consists of a vapor condenser, a diesel scrubber, and an activated carbon absorption bed.

In the 2001 HRA, only diesel was considered for this operation. This addendum evaluated the impact of light solvent on the previous estimated emissions and dispersion modeling for this source.

## 2.7 SOLIDS CONSOLIDATION

A small fraction of material received by the Site is solid. This material would typically be debris contaminated with liquids such as solvents or aqueous materials. The solid material is consolidated, possibly shredded, and sent off-site for disposal. Fugitive emissions from the consolidation operation would be the result of small, if any, evaporative losses from handling this material.

In the updated RCRA Part B Permit Application, the Site proposed to enclose this operation and vent any emissions to the air via an elevated stack rather than to allow the emissions to vent passively.  A fan would maintain a positive flow of air out of the enclosure.  In the 2001 HRA, this source was represented in dispersion modeling as a volume source (a source which has emissions with no momentum and originating from a volume of space rather than a point).  In this addendum, the same emissions from a stack (a point source of emissions with momentum) are evaluated.

### 2.8 ROLL-OFF BINS

According to the updated RCRA Part B Application, roll-off bins will be used at the Site for bulk storage of solid hazardous wastes.  A maximum of eight roll-off bins will be stored at the Site.  The potential for emissions from the roll-off bins is evaluated in this addendum.

# 3.0 EVALUATION OF EMISSIONS AND POTENTIAL OFF-SITE IMPACTS

This section of the addendum presents the qualitative or quantitative (as appropriate for the particular source) analysis used to evaluate the potential changes in emissions from the sources identified in Section 2.0, as compared to the estimates presented in the 2001 HRA. A summary of the revisions to the emission rates included in the 2001 HRA is presented in Table 4.

## 3.1 QUANTITATIVE EVALUATION

### 3.1.1 Tanks With Revised Specifications Including Large Volume Increases (Greater Than 10%)

Tanks with a revised volume that was 10% greater than that evaluated in the 2001 HRA were evaluated using the previous modeling for the old volume. Tanks with revised volumes that represent an increase of less than 10% relative to the 2001 HRA are discussed qualitatively in Section 4.2.1. Tank 27 was specified in the updated RCRA Part B Permit Application with a volume greater than 10% than that used in the 2001 HRA. According to Site personnel, the throughput rate listed for this tank in Table C.8 of the 2001 HRA was based on actual data and is not affected by the change in tank volume. In order to estimate the increase in the total tank emissions as a result of the increased tank volume, emissions based on the 2001 HRA tank parameters and the updated RCRA Part B Permit Application tanks parameters were estimated using the TANKS 4.0 program[2].

TANKS was used to estimate the emissions of one chemical from the tank using the revised tank specifications. N-methyl-2-pyrrolidone, the largest component of the organic waste stream in the 2001 HRA was selected. Then, the ratio of the emissions of this chemical (based on the updated RCRA Part B Permit Application tank volume) to the emission rate of this chemical presented in the 2001 HRA was calculated. This ratio, which would be the same for all the components in the tank, was applied to the chemical specific emission rates for the tank (as specified in the 2001 HRA) to estimate the chemical-specific emissions for the tank as specified in the updated RCRA Part B Permit Application.

Tanks A2, A3, A4, and A5 also had increased volumes (more than 10% greater than that used in the 2001 HRA) specified in the updated RCRA Part B Permit Application. According to Site personnel, the throughput rate for each of these tanks will increase to 600,000 gallons per year. In order to estimate the increase in the total tank emissions as a result of the increased tank volume, emissions based on the 2001 HRA tank parameters and the updated RCRA Part B Permit Application tank parameters were estimated using the TANKS 4.0 program. Emissions were estimated assuming the tanks contained n-methyl-2-pyrrolidone, the largest component of the organic waste stream in the 2001 HRA. The ratio of the updated RCRA Part B Permit Application emissions to the 2001 HRA emissions was calculated and applied to the chemical specific emission rates for the tanks from the 2001 HRA to estimate emissions.

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[2] TANKS is an USEPA-approved software program used to estimate the emissions resulting from breathing and working loses from tanks. TANKS is based on the emission estimation procedures from Chapter 7 of USEPA's *Compilation Of Air Pollutant Emission Factors* (AP-42). See http:://www.epa.gov/ttn/chief/software/tanks/

Tank 70 was included in the 2001 HRA, but according to the updated RCRA Part B Permit Application, this tank has been taken out of commission. Therefore, there would no longer be any potential off-site health impacts resulting from this tank's emissions.

Tank R96 is included in the updated RCRA Part B Permit Application, but was not included in the 2001 HRA. According to Site personnel, this tank is the same size and has the same waste stream composition as Tank R97. For this evaluation, emissions associated with Tank R96 were assumed to be the same as those estimated for Tank R97 in the 2001 HRA. This tank will also be located adjacent to Tank R97.

The potential off-site ambient air concentrations resulting from the revised and new tanks were estimated using prior modeling prepared for the 2001 HRA. The revised and new tanks are all located in existing tank farms previously modeled for the 2001 HRA. The potential health impact at the RME receptors from each tank farm or area was evaluated in the 2001 HRA. The concentrations resulting from the change in each affected tank farm or area at the RME receptors is the same as the fractional change in emissions from the affected tank farm or area. This is true because the dispersion model used in the 2001 HRA is based on the Gaussian plume model[3] that assumes that concentration is linear with emission rate. See Table 1 for the updated tank emission rates and fractional changes (as compared to the 2001 HRA).

### 3.1.2 Drum Storage Areas

The five storage areas included in the 2001 HRA were listed with revised storage capacities in the updated RCRA Part B Permit Application. The drum sampling area and West Storage building #1 were listed with increases in storage capacity. The North Storage building, South Storage building, and West Storage building #2 had decreases in the maximum storage capacity. In order to estimate the increase or decrease in the emissions from each drum storage area as a result of the revised drum storage capacities, the ratio of the updated RCRA Part B Permit Application storage capacity to the 2001 HRA storage capacity was calculated for each storage area and applied to the chemical specific emission rates for the storage areas in the 2001 HRA. See Table 3 for the revised drum storage capacities.

Drum storage in the drum pumping area was also added in the updated RCRA Part B Permit Application. The new emissions from drum storage in this area were added to the volume source used in the 2001 HRA to model drum storage emission in the drum sampling area. In this addendum, the dispersion modeling used to represent emissions from drum storage in the drum sampling area was used to represent emissions from the proposed drum storage in the drum pumping area. The ratio of the updated RCRA Part B Permit Application storage capacity for the drum sampling area to the 2001 HRA storage capacity for the drum pumping area was calculated and applied to the chemical specific emission rates for drum storage in the drum sampling area in the 2001 HRA.

[3] ISCST3 (Industrial Source Complex) model is a steady-state Gaussian plume model that can be used to estimate pollutant concentrations from a wide variety of sources associated with an industrial complex. ISCST3 is a USEPA-recommended model. See http://www.epa.gov/scram001/tt22.htm#isc

### 3.1.3 Inorganic Waste Treatment System

The updated RCRA Part B Permit Application proposes that a fabric filter (a "baghouse") would service the enclosed area where mixing of the inorganic waste and the stabilization agents would occur. The area will be ventilated with a fan to maintain a positive flow of air out of the enclosure. The baghouse would filter the outgoing air and capture much of the dust in the air. However, particulates of pozzolanic material, such as cement kiln dust, could be emitted.

This baghouse has not yet been designed in detail. To estimate the total maximum particulates emission rate, it was assumed that the baghouse would meet the Best Available Control Technology (BACT) standard for baghouses in similar service in the BAAQMD. Reviewing the BACT determinations on the BAAQMD website[4], it appears that this level is 0.006 grains per dry standard cubic feet. This is the BACT level for a baghouse at a cement facility. The Site estimates that the baghouse will have a volumetric exhaust flowrate of approximately 5,000 cfm. Therefore, it was estimated that the maximum emission rate from the baghouse would be approximately 0.26 pounds of particulates per hour.

According to the Site, cement kiln dust is most representative of the stabilization material that would be used in this operation. The typical speciation of cement kiln dust was provided by the USEPA[5], and used to speciate the total particulates estimated to be emitted from the baghouse (see Table 5). In estimating the emissions of individual metals from the baghouse, it was assumed that the metals profile of the particulates is represented by the mean typical composition provided in the USEPA document, with the exception of lead.

The table in the USEPA document notes that the mean lead concentration is 287 milligrams per kilogram (mg/kg) but that the median is 113 mg/kg. We note that the maximum lead concentration given is 2,620 mg/kg; therefore, it was assumed that the median was more representative of the typical lead composition of cement kiln dust as it appears that one sample skewed the mean lead concentration and thus using the mean would like be overly conservative.

Modeling parameters for this source are presented in Table 6. A refined dispersion model, ISCST3, was run to evaluate the off-site ambient air concentrations that could result from this source. The model was run using a point source as specified in this addendum to represent the emissions from this source. The model was run using an emission rate of 0.01 gram per second and was evaluated at the same receptor grid and discrete receptors used in the original modeling presented in the 2001 HRA. The modeling methodology described in detail in the 2001 HRA was followed in modeling the off-site concentrations for this source. The resulting normalized concentrations were then used to estimate the concentrations at the maximum residential and worker receptors of each compound emitted by the baghouse. The normalized concentrations were multiplied by the particulates emission rate. Each individual component of the baghouse particulates was speciated using the USEPA metals profile for cement kiln dust. This is a valid approach since concentration is linear in proportion to the emission rate. Concentrations of each compound emitted by the baghouse were also estimated at the maximum off-site residential and worker locations. These concentrations are presented in Table 8.

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[4] www.baaqmd.gov/permit/bactworkbook/
[5] United States Environmental Protection Agency (USEPA). 1998.

The average metal concentrations in soil due to deposition of emissions from the baghouse were calculated using the methodology presented in the California Air Pollution Control Officer's Association's (CAPCOA) *Air Toxics "Hot Spots" Program* (1993). The parameters used in this evaluation are presented in Table 7 and include deposition rate, evaluation period, chemical-specific half-lives, soil mixing depth, and bulk soil density. Deposition of particulate matter was calculated based on the modeled air concentration and assumes 70 years of accumulation. Each individual component of the baghouse particulates was speciated using the USEPA metals profile for cement kiln dust. The resulting soil concentrations are presented in Table 8.

### 3.1.4 Drum Liquefaction

The 2001 HRA evaluated both controlled emissions from the scrubber system and fugitive emissions from cleaning the drums and handling wet clean drums. The emissions were characterized as diesel vapors. In fact, the majority of the vapor emissions from this operation are likely to be solvent vapor. Solvent is used at a rate of approximately 700 gallons per day. Diesel is used at a rate of approximately 45 to 50 gallons per day. Furthermore, the solvent is much more volatile than diesel and, therefore, any emissions from the use of both these materials is likely to be dominated by the constituents of the solvent.

In Table C.18a of the 2001 HRA, the emissions of VOCs from the scrubber system were estimated from OVA readings. The estimated emissions of VOCs derived from these readings were assumed to be diesel vapors in the 2001 HRA. In this addendum, we revised the speciation of the emissions from the scrubber system to be characterized as organic solvent vapors. This reflects the greater usage of solvent and the greater volatility of the components in the solvent. The speciation of the volatile organic emissions would be the same as that used in the 2001 HRA for the emissions from sources at the Site handling the typical organic waste stream. The development of this organic vapor composition is discussed in detail in the 2001 HRA (see Section 5.2(a)(1)) and presented in Table C.3 of the 2001 HRA.

The 2001 HRA also assumed that the fugitive emissions from this source were diesel vapors. These fugitive emissions would likely result from some evaporation of diesel wetting the inside of clean, empty drums. It was assumed that there would be up to a 1% loss due to evaporation. Based on the revised diesel usage provided by Site personnel, the estimated fugitive emissions are 0.65 tons per year of diesel vapor (see Table 9).

Because these two sources of emissions are not different in this addendum from their physical representation in the 2001 HRA, the emissions have not been remodeled in this addendum. The scrubber emissions will have a different speciation for evaluation in this addendum but the dispersion characteristics of this source are the same as modeled in the 2001 HRA.

Similarly, the fugitive emissions from drum liquefaction will have a different speciation but the source characteristics are the same as modeled in the 2001 HRA. The normalized concentration estimated for a 0.01 grams per second (g/s) emission rate from this source was used with the speciation of organic vapors. The development of this organic vapor composition is discussed in detail in the 2001 HRA (see Section 5.2(a)(1)) and is presented in Table C.3 of the 2001 HRA. The emission rate reflects a 1% loss factor, as discussed above.

### 3.1.5 Solids Consolidation

The emissions from the control device would be limited by the Bay Area Air Quality Management District (BAAQMD) Rule 8-2-301 to 15 pounds per day (lbs/day). However, it is likely that the emissions from this source would be far less than this level, on the order of 1 lb/day, or less, post-control device. The updated RCRA Part B Permit Application proposes to use two carbon scrubbers in series (see E6.3 of the application package). This control device would typically realize at least 90% control efficiency or more (the control devices currently in place at the Site were assumed to have at least a 95% control efficiency based on Site estimates). An emission rate of 1 lb/day post-scrubber would mean that up to 10 lb/day of uncontrolled emissions are generated from consolidating solid waste. Based on our discussions with Site personnel, this is a conservative estimate of the emissions from this activity since most of the solid materials received and handled by the Site are minimally contaminated or are not contaminated with highly volatile compounds. This evaluation is based on 1 lb/day of volatile organic compounds emissions post-control device.

The speciation of these emissions would be the same as that used in the 2001 HRA for the emissions from solid waste consolidation. The development of this organic vapor composition is discussed in detail in the 2001 HRA (see Section 5.2(a)(1)) and presented in Table C.3.

Modeling parameters for this source are presented in Table 6. The solids consolidation operation emissions were changed in the manner in which they enter the atmosphere. The total emission rate from this source did not change. In the 2001 HRA, these emissions were ground-level with no momentum (represented by a volume source). In the updated RCRA Part B Permit Application, the emissions were described as elevated and with momentum. To evaluate the potential impact of this change on modeled off-site concentrations, a screening-level dispersion model, SCREEN3, was used to evaluate whether the solids waste consolidation source could have a potentially significant impact on the health impacts presented in the 2001 HRA.

The model was run using the volume source as specified in the 2001 HRA to represent the emissions from this source as modeled in the 2001 HRA. The model was also run using a point source as specified in this addendum to represent the same emissions but in this case emitted from an elevated stack. The model was run in each case using an emission rate of 1 gram per second and was evaluated at a series of distances from the source. The results of the two separate runs are presented in Appendix B of this addendum.

In comparing the modeled concentrations, the results obtained using a volume source are much higher at receptor locations close to the source than the results obtained for a point source. The further the receptor point is from the source, the closer the results from the two runs converge. Therefore, the modeling used in the 2001 HRA would estimate greater off-site concentrations than if the source had been modeled as a point source (as currently described). Because the current proposed configuration of this source would likely lead to lower off-site concentrations than those used in the 2001 HRA evaluation (based on representing this source as a volume source), it is likely that this proposed change could lead to a small decrease in off-site concentrations.

In order to provide a refined analysis of changes to the health impacts at the maximum residential and worker locations identified in the 2001 HRA, the emissions from the exhaust point on the control device were also modeled using the ISC3 model, following the same methodology used in the 2001 HRA (see Section 5.3). In the 2001 HRA, two sets of 5-years of meteorological data were used in the modeling. For each set, an average annual concentration was calculated from the annual concentration modeled for each of the five years of meteorological data. The maximum of the two average annual concentrations for each set of five years of meteorological data was determined. It was found that for every source considered in the 2001 HRA, the 5-year meteorological data set collected at the BAAQMD meteorological station in San Carlos, California (station #6901) resulted in the more conservative average annual concentration, hence this meteorological data set was used in this dispersion modeling. Because this source is located on top of a new structure, this small structure (the enclosure of the solids waste consolidation operation) was included in the building downwash analysis. Building downwash analyses evaluate the potential effect a structure may have on the aerodynamic characteristics of an emissions stream.

The solid waste consolidation scrubber source was modeled using a 0.01 gram per second emission rate. The resulting normalized concentrations at the maximum residential and worker locations identified in the 2001 HRA were then used to estimate the concentrations at these receptors of each compound emitted by the scrubber. The normalized concentrations were multiplied by the volatile organic compounds emission rate. Each individual organic compound was then estimated using the speciation of the organic vapor emissions (see the 2001 HRA Table C.3). This is a valid approach since concentration is linear in proportion to emission rate.

### 3.1.6 Removed Sources

This addendum identified two sources of emissions that were considered in the 2001 HRA but are now no longer proposed or existing. The updated RCRA Part B Permit Application indicates that there has been a change in the proposed method of truck washing at the Site. The 2001 HRA considered the use of solvent material in some of the truck washing operations. However, the updated RCRA Part B Permit Application proposes that only water and detergent will be used in these operations. Therefore, the emissions associated with this source in the 2001 HRA will no longer exist and the health impacts presented in the 2001 HRA would be reduced slightly.

In addition, Tank 70 has been removed from service since the 2001 HRA was prepared. This tank is located in Zone 8. The emissions from this tank represent 32% of the total emissions from Zone 8. Hence the impact of Zone 8 on the estimated health impacts at the maximum residential and worker receptors identified in the 2001 HRA have been reduced by 32%. The total health impacts presented in the 2001 HRA would be reduced slightly.

The truck loading/unloading transfer area that was included in the 2001 HRA is no longer in operation at the Site. This source was included in the Zone 6 tank area source group in the 2001 HRA. The emissions from this source represented 64% of the total emissions from Zone 6 in the 2001 HRA. Therefore, the impact of Zone 6 on the estimated health impacts at the maximum residential and worker receptors identified in the 2001 HRA have been reduced by approximately 64%. This source group was responsible for 18% to 35.5% of the cancer and chronic noncarcinogenic health impacts presented in the 2001 HRA for the maximum residential and worker receptors. Therefore, the removal of this source results in a sizable reduction in the total health impacts presented in the 2001 HRA.

## 3.2 QUALITATIVE EVALUATION

### 3.2.1 Tanks With Volume Decreases or Small Volume Increases

Several tanks were specified in the updated RCRA Part B Permit Application with volumes that differed from the information used in preparing the 2001 HRA. This section discusses how the volume changes were evaluated in order to identify tanks that required a quantitative re-evaluation and those which required only a qualitative evaluation in order to determine their relative impact on the off-site health impacts presented in the 2001 HRA.

Emissions from storage tanks can be categorized as breathing (or standing) losses and working losses. Breathing losses are a function of tank vapor space[6]; emissions vary linearly with tank volume. Working losses are a function of the annual net tank throughput and a dimensionless turnover factor[7]. For tanks with 36 turnovers per year or less, working losses vary linearly with throughput. For tanks with more than 36 turnovers per year, working losses vary as a function of:

$$Q \times K_N$$

where:

$Q$ = annual net throughput (barrels/year)

$K_N$ = turnover factor = $(180 + N)/6N$

$N$ = number of turnovers per year = $(5.614\ Q)/V_{LX}$

$V_{LX}$ = tank maximum liquid volume ($ft^3$)

The turnover factor decreases as the number of turnovers per year increases. Therefore, if the annual net throughput remains constant and the number of turnovers per year increases, working losses will decrease.

#### 3.2.1.1 Tanks With Large Volume Decreases (Greater than 10%)

The following tanks have a decrease in volume of greater than 10% for the updated RCRA Part B Permit Application relative to the volume specified in the 2001 HRA:

- R97,
- R90,

[6] United States Environmental Protection Agency (USEPA). 1997. AP-42, Section 7.1: Organic Liquid Storage Tanks. Equation 1-2.
[7] United States Environmental Protection Agency (USEPA). 1997. AP-42, Section 7.1: Organic Liquid Storage Tanks. Equation 1-23.

- I,
- J,
- 85, and
- Wastewater treatment (WWT)

Since the volumes of these tanks have decreased relative to the volumes used to estimate emissions in the 2001 HRA, breathing losses will decrease linearly with the decrease in volume. According to Site personnel, the throughput rates listed for these tanks in Table C.8 of the 2001 HRA are based on actual data and are not affected by the changes in tank volume. Tanks R97, R90, and 85 have less than 36 turnovers per year and no change in throughput; therefore, working losses for these tanks will remain the same as estimated in the 2001 HRA. Tanks I, J, and WWT have greater than 36 turnovers per year and no change in throughput; therefore, as noted above, working losses from these tanks will decrease relative to the emissions estimated in the 2001 HRA.

#### 3.2.1.2 Tanks With Small Volume Decreases (Less than 10%)

Seventeen tanks were specified with a decrease in volume of less than 10% as compared to the volume used in the 2001 HRA evaluation (see Table 2). Breathing losses estimates for these tanks will decrease linearly with the decrease in volume. According to Site personnel, the throughput rates listed for these tanks in Table C.8 of the 2001 HRA are based on actual data and are not affected by the changes in tank volume. Tanks A, B, C, E, 16, 17, 19, 20, 61, 75, and 81 have less than 36 turnovers per year and no change in throughput; therefore, working losses for these tanks will remain the same as estimated in the 2001 HRA. Tanks D, H, 106, 107, 108, and 109 have greater than 36 turnovers per year and no change in throughput; therefore, as noted above, working losses from these tanks will decrease relative to the emissions estimated in the 2001 HRA.

#### 3.2.1.3 Tanks With Small Volume Increases (Less than 10%)

Eighteen tanks were specified with an increase in volume of less than 10% as compared to the volume used in the 2001 HRA evaluation (see Table 2). Emissions from these tanks result from breathing and working losses.

The breathing loss estimates for these tanks in the 2001 HRA will increase linearly with the increases in volume. Based on the increases in volume of these tanks, breathing losses will increase between 0.9% and 6.7% for the individual tanks relative to the emissions estimated in the 2001 HRA. These tanks were modeled in the Zone 4, Zone 6, Zone 8, and Zone E source groups in the 2001 HRA. Based on the fraction of emissions that each tank accounts for of the total emissions from its respective source group, breathing loss emissions from the Zone 4, Zone 6, Zone 8, and Zone E source groups would increase 0.5%, 0.7%, 0.1%, and 5.3%, respectively.

According to Site personnel, the throughput rates listed in Table C.8 of the 2001 HRA for these tanks are based on actual data and are not affected by the changes in tank volume. Tanks N, O, A-6, A-7, 1, 2, 5, 84, 101, 102, 103, 104, and 105 have less than 36 turnovers per year and no change in throughput; therefore, working losses for these tanks will remain the same as estimated in the 2001 HRA. Tanks 3, 8, 12, and 83 have greater than 36 turnovers per year and no change in throughput; therefore, as noted above, working losses from these tanks will decrease relative to the emissions estimated in the 2001 HRA. Tank 9 had greater than 36 turnovers per year in the 2001 HRA, less than 36 turnovers per year in the updated RCRA Part B Permit Application, and no change in throughput; therefore, working losses from this tank will increase approximately 2.9% relative to the emissions estimated in the 2001 HRA. Tank 9 was modeled in the Zone 6 source group in the 2001 HRA. Based on the fraction of emissions that Tank 9 accounts for of the total emissions in Zone 6, working loss emission from the Zone 6 source group would increase by 0.07%.

Based on the fractional increase in breathing and working loss emissions for the Zone 4, Zone 6, Zone8, and Zone E source groups, the maximum increase in the health impacts at any receptor due to these source groups would be 5.3%, and would likely be less at many receptors.

### 3.2.2 Debris Shredding

The shredding system emissions are vented to the scrubber system currently used by the drum liquefaction system. According to the Site, the scrubber system was designed to handle the emissions from both the liquefaction unit and the debris shredder. The emissions estimate presented in the 2001 HRA for the scrubber system was based on exit stream organic concentration measurements; hence any emissions from the debris shredder would be included in the original analysis. There may be fugitive emissions resulting from the handling of open bins of material in and out of the shredding system before they are closed; however, this would likely be of a negligible quantity given the duration material would be exposed to the air and the small quantity of volatile material mixed in with the solid material.

Because any emissions resulting from this operation are already represented in the emissions modeled for the drum liquefaction scrubber unit, additional dispersion modeling for this source is not required and no revisions to the 2001 HRA off-site health impact estimates are required for this source.

### 3.2.3 Aerosol Can Depressurization

The bulk of the expected aerosol cans handled at the Site would be spray paints and lubricants. It was assumed that aerosol paints would make up 50% of the throughput and spray lubricants would make up the other 50%. There may be other types of aerosol cans accepted by the Site for disposal. Other types of aerosol cans are expected to be a small fraction of the total throughput and would vary in composition widely. Therefore, any one component would represent a very small fraction of the total throughput of chemicals through this system.

To represent the spray paints, the Site provided the Material Safety Data Sheets of two products: Rust-Oleum Spray Paint and Premium Décor Spray Enamel (General Paint & Manufacturing Company). WD-40 and Moly Dry Lube were used to represent the spray lubricants. The compositions of these products are presented in Table 10.

Components of the material in the cans that are liquids at ambient temperatures (i.e., whose vapor pressures are less than atmospheric at ambient temperatures) would be condensed and collected. Only the propellant is a gas at ambient temperatures (i.e., has a vapor pressure greater than atmospheric at ambient temperatures). Therefore, it was assumed that only the propellant could be emitted to the air once the evacuated contents of the aerosol can have passed through the condenser and all remaining vaporous material passes through the carbon absorption system. Emissions of the other constituents present in the aerosol can would be expected to be negligible.

The propellant is typically either carbon dioxide or a mixture of butane, isobutane, and propane, with most aerosol can manufacturers moving to carbon dioxide as a propellant in the future. WD-40 previously used liquefied petroleum gas (LPG) as a propellant. It currently uses carbon dioxide as do many other brands of spray lubricant. It can be assumed that older cans would most likely have the organic propellant and cans manufactured recently would have either carbon dioxide or the organic propellant mixture. Moly Dry Lube uses 1,1-difluoroethane as a propellant. Some negligible emissions of the other (non-propellant) components of the aerosol can contents could result from some partitioning between the condensed phase and the vapor phase of each compound. However, these emissions would be negligible considering both the total quantity of each condensable component through the system and the fact that these compounds have low vapor pressures at ambient temperatures.

None the typical components of the propellant mixture (butane, isobutene and propane), LPG, or 1,1-difluoroethane were in the original master list considered in the 2001 HRA (because gases would not be handled through the conventional recycling processes at the Site). As 1,1-difluoroethane is the only chemical in the propellant mixture with a USEPA or California Environmental Protection Agency (CalEPA) toxicity factor, this chemical has been quantitatively evaluated in this addendum.

A screening-level dispersion model, SCREEN3, was used to evaluate whether emissions from the aerosol can depressurization source could have a potentially significant impact on the health impacts presented in the 2001 HRA. The model was run using volume sources to represent emissions from this source. Aerosol can depressurization is a mobile source. Site personnel estimates that 75% of usage of the source will occur in the north building, with the balance of usage occurring in the south building. In the 2001 HRA, volume sources were used to estimate emissions from sources in these buildings. The solid waste consolidation fugitives and drum storage south fugitives sources were used to model emissions from the north and south buildings, respectively. The same modeling parameters for these sources were used to model aerosol can depressurization emissions. Modeling parameters for theses sources are presented in Table 11.

Emissions of 1,1-difluoroethane were estimated to be 0.52 pounds per day, as shown in Table 11. This estimate was based on the composition of the Moly Dry Lube spray lubricant, the maximum can throughput per day, the total mass of material in each can, and a carbon absorption unit control efficiency of 95%. The maximum hourly process rate is 20 cans per minute. Therefore, for modeling purposes it was conservatively assumed that all daily emissions occur in a single hour. The distance to the nearest property boundary is approximately 28 meters for the north building and 36 meters to south building. Modeling was conducted for receptors at or beyond these distances from the sources in order to estimate the maximum off-site concentrations due to aerosol can depressurization. The results of the SCREEN3 model runs are presented in Appendix C. The maximum hourly concentrations from SCREEN3 were converted to annual average concentrations using the USEPA conversion factor of 0.08.

The maximum hourly concentrations of 1,1-difluorethane estimated using SCREEN3 were 351.4 $\mu g/m^3$ and 83.4 $\mu g/m^3$, respectively, for the north and south building volume sources. It was conservatively assumed that the maximum concentration for each volume source occurs at the same receptor location; this results in a total maximum hourly 1,1-difluoroethane concentration of 434.8 $\mu g/m^3$. This maximum hourly concentration was converted to an annual average concentration of 34.8 $\mu g/m^3$ using the USEPA conversion factor of 0.08.

### 3.2.4 Roll-off Bins

The nature of the hazardous wastes will determine the type of roll-off container used. Hazardous wastes not subject to 40 CFR Part 264 Subpart CC standards (i.e., less than 500 ppmw VOCs) may be stored in open-top bins covered with rubberized canvas or equivalent fitted tarps. These types of wastes may also be stored in bins equipped with rolling covers. Hazardous wastes with 500 ppmw or greater volatile organic content will be stored in bins that comply with 22 CCR 66264.1086(d)(1)(B) or (C). Paragraph (B) of this regulation requires the bin to operate with "no detectable organic emissions". Alternately, paragraph (C) allows for an annual demonstration that the bin is "vapor-tight" in accordance with USEPA Method 27. Based on the design of the roll-off bins, and in compliance with the applicable regulations, emissions from solid hazardous wastes stored in roll-off bins at the Site are assumed to be negligible.

# 4.0 EVALUATION OF CHANGES TO POTENTIAL SITE HEALTH IMPACTS

This section presents the evaluation of the potential change to the estimated off-site health impacts presented in the 2001 HRA, as a result of the revisions to sources discussed in Sections 2.0 and 3.0 of this addendum.

This evaluation has been divided into three parts. In the first part, the potential cancer risks and noncancer hazard indices (HIs) due to metals emissions from the baghouse are evaluated. This source is evaluated separately as metals emissions were not included in the 2001 HRA. In the second part, potential changes in the estimated cancer risks and noncancer HIs due to VOC emissions from the revised sources are evaluated. These changes are quantitatively addressed for the maximum exposed residential and worker receptor locations as identified in the 2001 HRA. It should be noted that due to changes in emission rates that resulted from the updated RCRA Part B Permit Application, the maximum exposed resident and worker receptors as identified in the 2001 HRA may no longer represent the maximally exposed individual. However, in the third part an evaluation of risks at discrete locations around the facility was conducted. This part of the evaluation has shown an overall reduction in risk as a result of the changes in the updated RCRA Part B Permit Application.

## 4.1 METALS EVALUATION

As discussed in Section 3.1.3, potential emissions from the baghouse include metal particulates. These metals may be present as particulates in the air or may deposit on the nearby soils. Table 8 summarized the maximum estimated metal concentrations in air and soil at a residential or worker receptor. In this section, the estimated cancer risks and noncancer hazard indices due to potential exposure to these chemicals is evaluated.

As only volatile chemicals were evaluated in the 2001 HRA, inhalation was the potential pathway of concern. As metals can deposit and accumulate in soil, the metals evaluation presented here also assesses potential exposures due to incidental ingestion and dermal contact with soil. The exposure assumptions used in this evaluation are summarized in Table 12 for residents (adult and child) and workers. The chemical-specific dermal absorption fraction from soil is presented in Table 13 and the toxicity factors are identified in Table 14. For this evaluation, the hierarchy of sources for the toxicity values used corresponds to CalEPA guidelines (1994).

Estimating cancer risks and noncancer HIs requires information regarding the level of intake of the chemical and the relationship between intake of the chemical and its toxicity as a function of human exposure to the chemical. The methodology used to derive the cancer risks and noncancer HIs for the selected chemicals is based on guidance provided by USEPA (1989) and CalEPA (1992, 1994).

One can estimate the potential risk associated with a chemical using equations that describe the relationships among the estimated intake of site-related chemicals, toxicity of the specific chemicals, and overall risk for carcinogenic and noncarcinogenic health effects. For carcinogenic effects, the relationship is given by the following equation (USEPA 1989):

$$\text{Risk} = \text{I x CSF}$$

Where:

| | | |
|---|---|---|
| Risk | = | Cancer Risk; the incremental probability of an individual developing cancer as a result of exposure to a particular cumulative dose of a potential carcinogen (unitless) |
| I | = | Intake of a chemical (mg chemical/kg body weight-day) |
| CSF | = | Cancer Slope Factor (mg chemical/kg body weight-day)$^{-1}$ |

The relationship for noncarcinogenic effects is given by the following equation (USEPA 1989):

$$\text{HQ} = \frac{\text{I}}{\text{RfD}}$$

Where:

| | | |
|---|---|---|
| HQ | = | Hazard Quotient; an expression of the potential for noncarcinogenic effects, which relates the allowable amount of a chemical (RfD) to the estimated site-specific intake (unitless) |
| I | = | Intake of chemical (mg chemical/kg body weight-day) |
| RfD | = | Reference Dose; the toxicity value indicating the threshold amount of chemical contacted below which no adverse health effects are expected (mg chemical/kg body weight-day). |

The HI is the sum of more than one hazard quotient for multiple substances and/or multiple exposure pathways.

The National Contingency Plan (NCP)(40 Code of Federal Regulations 300) is commonly cited as the basis for acceptable incremental risk levels. According to the NCP, lifetime incremental cancer risks posed by a site should not exceed one hundred in a million (1 x $10^{-4}$) to one in a million (1 x $10^{-6}$). For noncancer health hazards, a target HI of one is identified. Individual chemical exposures that yield HIs greater than 1 may be of concern for noncancer health effects (USEPA 1989).

Cancer risks and noncancer HIs were calculated in this metals evaluation for the maximum off-site residents and worker locations for the reasonable maximum exposure (RME) scenario. A summary of the cumulative cancer risks and noncancer HIs are presented in Table 15 for residents and Table 16 for workers. As shown in these tables, the estimated lifetime incremental cancer risks are less than 1 x $10^{-8}$ for all populations and the estimated HIs are less than one.

In addition, the potential acute hazard indices were also evaluated for the maximum location. The results of this evaluation are shown in Table 17. As shown in this table, the estimated acute HI is 0.001, well below the target noncancer HI of one.

## 4.2 MAXIMUM EXPOSED RECEPTOR LOCATIONS

The maximum exposed residential and worker receptors, as identified in the 2001 HRA, are shown on Figure 2. This section discussed changes in the estimated cancer risks and HIs at these locations due to VOC emissions from revised and new sources discussed in this addendum.

### 4.2.1 Resident – Future Emission Scenario

The maximum residential receptor identified in the 2001 HRA was re-evaluated based on the updated future emissions. As shown in Table 18, the estimated reasonable maximum exposure (RME) cancer risk for a resident at this location is $2.5 \times 10^{-6}$. This estimated risk has decreased approximately 21% based on the source revisions discussed in Sections 2.0 and 3.0. As shown in Table 19, no individual chemical has an estimated risk of greater than $1 \times 10^{-6}$. The major chemical contributors to the estimated cancer risk at this location are as follows:

- Gasoline ($5.3 \times 10^{-7}$),
- Benzene ($5.1 \times 10^{-7}$),
- Methylene chloride ($4.3 \times 10^{-7}$),
- Chloroform ($3.1 \times 10^{-7}$),
- 2-nitropropane ($2.0 \times 10^{-7}$),
- Hydrazine ($1.4 \times 10^{-7}$), and
- Carbon tetrachloride ($1.4 \times 10^{-7}$).

The estimated chronic hazard index (HI) for a resident at this location is less than 1.

Table 19 presents a summary of the estimated cancer risk for each source group revision addressed in this addendum as compared to the 2001 HRA. No single air emission source group addressed in this addendum has an estimated cancer risk greater than $1 \times 10^{-6}$. Among the source groups addressed in this addendum, the major source contributors to the estimated cancer risk are as follows:

- Drum Storage ($6.2 \times 10^{-7}$)
- Tank Farm Q, Zone 8 ($2.8 \times 10^{-7}$)
- Tank Farm A, Zone 6 ($2.0 \times 10^{-7}$)

As the total estimated cancer risk due to potential exposures to metals from baghouse emissions was less than $1 \times 10^{-8}$ (see Section 4.1), this source will not contribute significantly to the overall risk estimate for the Site.

In addition, potential emission of 1,1-difluoroethane from the aerosol can depressurization operation was also evaluated. This chemical was not included in the 2001 HRA. The USEPA chronic reference exposure level for 1,1-difluoroethane is 40,000 $\mu g/m^3$. As discussed in Section 3.2.3, the maximum off-site concentration was estimated to be 34.8 $\mu g/m^3$. The estimated noncancer HI for this chemical would be well below the target level of one and would not significantly add to the overall off-site impact.

### 4.2.2 Worker – Future Emission Scenario

The maximum worker receptor identified in the 2001 HRA was re-evaluated based on the updated future emissions. As shown in Table 18, the estimated RME cancer risk for a worker at this location is $5.0 \times 10^{-6}$. This estimated risk has decreased approximately 28% based on the source revisions discussed in Sections 2.0 and 3.0. As shown in Table 20, two chemicals have an estimated risk of greater than $1 \times 10^{-6}$. These chemicals are as follows:

- Gasoline ($1.2 \times 10^{-6}$) and
- Benzene ($1.1 \times 10^{-6}$),.

The estimated chronic HI for a worker at this location is less than 1.

Table 20 presents a summary of the estimated cancer risk for each source group revision addressed in this addendum as compared to the 2001 HRA. No single air emission source group addressed in this addendum has an estimated cancer risk greater than $1 \times 10^{-6}$. Among the source groups addressed in this addendum, the major source contributors to the estimated cancer risk are as follows:

- Drum Storage ($7.3 \times 10^{-7}$),
- Tank Farm A, Zone 6 ($6.5 \times 10^{-7}$)
- Tank Farm Q, Zone 8 ($5.2 \times 10^{-7}$),
- Tank Farms H and T, Zone 7b ($1.3 \times 10^{-7}$), and
- Tank Farm D, Zone 10 ($1.1 \times 10^{-7}$).

As the total estimated cancer risks due to potential exposures to metals from baghouse emissions was less than $1 \times 10^{-8}$ (see Section 4.1), this source will not contribute significantly to the overall risk estimate for the Site.

## 4.3 UPPER BOUND ESTIMATE OF REVISED HEALTH IMPACTS

As discussed earlier, the maximum exposed residential and worker receptors, as identified in the 2001 HRA, may not represent the locations of the maximum health impacts based on the new and revised sources of emissions in this addendum. In order to address this possibility, an evaluation of risks at a variety of locations around the Site, as shown in Figure 3, was conducted. As shown in Table 21, at all points tested, the overall risks were reduced. Based on this analysis, it appears that risks were reduced overall as a result of the revisions discussed in this HRA Addendum.

# 5.0 CONCLUSIONS

A 2001 HRA for the Site was submitted to DTSC in February 2001. Since that time, the RCRA Part B Permit Application has been updated. The purpose of this addendum was to evaluate potential source revisions as identified in the updated RCRA Part B Permit Application and evaluate potential changes to the conclusions of the 2001 HRA.

As discussed in this addendum, the updated RCRA Part B Permit included new, revised and removed source groups. For these sources, both changes in emissions and potential health impacts to the surrounding community were evaluated.

The addition of a baghouse to the Site for inorganic waste treatment was evaluated separately as metals were not included in the 2001 HRA. An evaluation of this new source shows that the estimated cancer risks are less than $1 \times 10^{-8}$ and the noncancer HIs are less than one for both the maximum residential and worker receptors.

Potential changes in the estimated cancer risks and noncancer HIs due to VOC emissions from the revised sources were also evaluated. These changes were quantitatively addressed for the maximum exposed residential and worker receptor locations as identified in the 2001 HRA. The estimated risks at these locations decreased by approximately 21% and 28%, respectively from the 2001 HRA. A summary of the cumulative cancer risks in this addendum shows that the estimated lifetime incremental risk at these locations are less than $1 \times 10^{-5}$ risk level used for Proposition 65 and well within the acceptable risk level used by USEPA for hazardous waste sites ($1 \times 10^{-4}$ to $1 \times 10^{-6}$). The HIs calculated in this addendum for these locations are below one for all populations evaluated. Individual chemical exposures that yield HIs of less than 1 are not expected to result in adverse noncancer health effects (USEPA 1989).

The total Site VOC emissions presented in this addendum represent a reduction compared to the 2001 HRA. The total Site VOC emissions in this addendum are 17.46 tons per year as compared to 19.83 tons per year in the 2001 HRA. This represents a net reduction in VOC emissions of 2.37 tons per year or approximately 12%.

As discussed in Section 9.0 (Ecological Assessment) of the 2001 HRA, volatile emissions from the facility are not expected to be a significant source of exposure for ecological receptors in the vicinity of the Site. In addition, potential metals deposition on surrounding soil from the proposed baghouse is estimated to be well below naturally occurring levels of metals in soil.

Based on the results of this addendum, no significant changes are expected to the conclusions of the 2001 HRA.

# 6.0 REFERENCES

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# TABLES

**Table 1**
**Tanks Evaluated Quantitatively**
**Romic Facility**
**East Palo Alto, California**

| Storage Tank | Tank Farm or Zone | Storage Capacity (gallons) | | | Throughput (gallons/year) | | Turnovers (per year) | | VOC Emissions (pounds/year) | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RCRA Part B Permit Application | 2001 HRA | Difference | RCRA Part B Permit Application | 2001 HRA | RCRA Part B Permit Application | 2001 HRA | RCRA Part B Permit Application | 2001 HRA | Fractional Increase | |
| T-27 | 7B | 8,800 | 8,000 | 10% | 14,016 | 14,016 | 2 | 2 | 22.2 | 20.4 | 1.1 | |
| T-70 | 8 | --- | 126,904 | --- | --- | 103,437 | --- | 1 | --- | 2,028 | --- | Out of commission |
| R96 | 10 | 5,800 | --- | --- | 251,670 | --- | 43 | --- | 320.8 | --- | --- | New tank |
| A-2 | F | 12,000 | 2,000 | 500% | 600,000 | 20,000 | 50 | 10 | 16.9 | 1.2 | 14.3 | |
| A-3 | F | 12,000 | 2,000 | 500% | 600,000 | 20,000 | 50 | 10 | 16.9 | 1.2 | 14.3 | |
| A-4 | F | 12,000 | 2,000 | 500% | 600,000 | 20,000 | 50 | 10 | 16.9 | 1.2 | 14.3 | |
| A-5 | F | 12,000 | 2,000 | 500% | 600,000 | 20,000 | 50 | 10 | 16.9 | 1.2 | 14.3 | |

# Table 2
# Tanks Evaluated Qualitatively
# Romic Facility
# East Palo Alto, California

| Storage Tank | | Tank Farm or Zone | Storage Capacity (gallons) | | | Throughput (gallons/year) | | Turnovers (per year) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | RCRA Part B Permit Application | 2001 HRA | Difference | RCRA Part B Permit Application | 2001 HRA | RCRA Part B Permit Application | 2001 HRA |
| Tanks with Greater than 10% Decrease in Storage Capacity | R97 | 10 | 4,500 | 12,000 | -63% | 59,081 | 59,081 | 13 | 5 |
| | WWT | 5 | 4,400 | 6,365 | -31% | 68,281 | 68,281 | 16 | 11 |
| | T-85 | 4 | 12,000 | 16,450 | -27% | 2,121,889 | 2,121,889 | 177 | 129 |
| | T-90 (R90) | E | 4,794 | 6,000 | -20% | 151,438 | 151,438 | 32 | 25 |
| | T-4 | 6 | 4,500 | 5,600 | -20% | 152,209 | 152,209 | 34 | 27 |
| | I | 5 | 5,800 | 6,732 | -14% | 251,670 | 251,670 | 43 | 37 |
| | J | 5 | 5,800 | 6,732 | -14% | 283,841 | 283,841 | 49 | 42 |
| Tanks with Less than 10% Increase in Storage Capacity | T-75 | 8 | 12,700 | 13,513 | 6% | 101,915 | 101,915 | 8 | 8 |
| | T-81 | 8 | 3,000 | 3,184 | 6% | 82,713 | 82,713 | 28 | 26 |
| | T-20 | 9a | 2,000 | 2,082 | 4% | 67,240 | 67,240 | 34 | 32 |
| | A | 5 | 5,600 | 5,687 | 2% | 191,957 | 191,957 | 34 | 34 |
| | B | 5 | 5,600 | 5,687 | 2% | 193,350 | 193,350 | 35 | 34 |
| | C | 5 | 5,600 | 5,687 | 2% | 177,444 | 177,444 | 32 | 31 |
| | D | 5 | 5,600 | 5,687 | 2% | 289,465 | 289,465 | 52 | 51 |
| | E | 5 | 5,600 | 5,687 | 2% | 163,358 | 163,358 | 29 | 29 |
| | H | 5 | 5,600 | 5,687 | 2% | 209,791 | 209,791 | 37 | 37 |
| | T-61 | 8 | 13,400 | 13,600 | 1% | 111,791 | 111,791 | 8 | 8 |
| | T-16 | 9a | 2,000 | 2,028 | 1% | 46,952 | 46,952 | 23 | 23 |
| | T-17 | 9a | 2,000 | 2,028 | 1% | 66,678 | 66,678 | 33 | 33 |
| | T-19 | 9a | 2,000 | 2,025 | 1% | 50,721 | 50,721 | 25 | 25 |
| | T-106 | 7b | 8,500 | 8,578 | 1% | 324,460 | 324,460 | 38 | 38 |
| | T-107 | 7b | 8,500 | 8,578 | 1% | 324,460 | 324,460 | 38 | 38 |
| | T-108 | 7b | 8,500 | 8,578 | 1% | 324,460 | 324,460 | 38 | 38 |
| | T-109 | 7b | 8,500 | 8,578 | 1% | 324,460 | 324,460 | 38 | 38 |
| Tanks with Less than 10% Decrease in Storage Capacity | N | E | 9,290 | 8,705 | -7% | 151,438 | 151,438 | 16 | 17 |
| | O | E | 9,290 | 8,705 | -7% | 151,438 | 151,438 | 16 | 17 |
| | A-6 | E | 4,794 | 4,505 | -6% | 151,438 | 151,438 | 32 | 34 |
| | A-7 | E | 4,794 | 4,505 | -6% | 151,438 | 151,438 | 32 | 34 |
| | T-8 | 6 | 4,500 | 4,234 | -6% | 297,385 | 297,385 | 66 | 70 |
| | T-12 | 6 | 4,500 | 4,234 | -6% | 211,975 | 211,975 | 47 | 50 |
| | T-5 | 6 | 6,360 | 6,000 | -6% | 7,868 | 7,868 | 1 | 1 |
| | T-9 | 6 | 6,360 | 6,000 | -6% | 223,616 | 223,616 | 35 | 37 |
| | T-105 | 8 | 11,175 | 10,693 | -5% | 324,460 | 324,460 | 29 | 30 |
| | T-1 | 6 | 4,200 | 4,056 | -4% | 70,977 | 70,977 | 17 | 17 |
| | T-83 | 4 | 12,000 | 11,750 | -2% | 4,171,684 | 4,171,684 | 348 | 355 |
| | T-84 | 4 | 12,000 | 11,750 | -2% | 72,093 | 72,093 | 6 | 6 |
| | T-2 | 6 | 5,100 | 5,000 | -2% | 124,551 | 124,551 | 24 | 25 |
| | T-3 | 6 | 5,100 | 5,000 | -2% | 197,689 | 197,689 | 39 | 40 |
| | T-101 | 4 | 12,000 | 11,893 | -1% | 280,042 | 280,042 | 23 | 24 |
| | T-102 | 4 | 12,000 | 11,893 | -1% | 388,779 | 388,779 | 32 | 33 |
| | T-103 | 4 | 12,000 | 11,893 | -1% | 310,402 | 310,402 | 26 | 26 |
| | T-104 | 4 | 12,000 | 11,893 | -1% | 318,617 | 318,617 | 27 | 27 |

**Table 3**
**Revisions to Drum Storage and Sampling Area Capacities**
**Romic Facility**
**East Palo Alto, California**

| Drum Storage Area | Number of Drums | | |
|---|---|---|---|
| | RCRA Part B Permit Application | 2001 HRA | Difference |
| Drum Sampling Area | 1,507 | 866 | 74% |
| North Drum Storage Building | 830 | 960 | -14% |
| South Drum Storage Building | 2,630 | 2,756 | -5% |
| West Storage Area #1 | 336 | 320 | 5% |
| West Storage Area #2 | 1,244 | 1,316 | -5% |
| Drum Pumping Area | 80 | --- | --- |
| **Total** | **6,627** | **6,218** | **7%** |

## Table 4
## Revised Emission Estimates
## Romic Facility
## East Palo Alto, California

| Model ID | Source Description | Hours of Operation | | | Emission Factor | | | Throughput Quantity | | | Emissions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hrs/Day | Hrs/Yr | Note | Value | Units | Note | Value | Units | Note | (lbs/yr) | (tons/yr) | (lbs/day) |
| FUELBLND | Vent for Drum Liquefaction Control System | 10 | 3,650 | a | 306.5 | ppm | b | 0.001 | $m^3$ of air/s | c | 18.7 | 0.009 | 0.05 |
| ZONEF | Control System for Zone F tanks | 24 | 8,760 | d | 67.5 | lbs/year | e | 95% | % control | f | 3.4 | 0.002 | 0.009 |
| CONSOLID | Consolidation Fugitives | 10 | 3,650 | a | 1.0 | lb/day | g | - | - | - | 365 | 0.18 | 1.0 |
| FUGFB | Drum Liquefaction Fugitives | 10 | 3,650 | a | 1% | % of diesel | h | 18,200 | gal/yr | i | 1,292 | 0.65 | 3.5 |
| DSSAMP | Drum Storage Fugitives (Sampling and Pumping Areas) | 24 | 8,760 | d | 4.2E-05 | kg/hr/drum | j | 1,587 | drums | k | 1,287 | 0.64 | 3.5 |
| DSCONS | Drum Storage North Fugitives | 24 | 8,760 | d | 4.2E-05 | kg/hr/drum | l | 830 | drums | k | 673 | 0.34 | 1.8 |
| DSSOUTH | Drum Storage South Fugitives | 24 | 8,760 | d | 4.2E-05 | kg/hr/drum | l | 2,630 | drums | k | 2,133 | 1.1 | 5.8 |
| DSWEST1 | Drum Storage West 1 Fugitives | 24 | 8,760 | d | 4.2E-05 | kg/hr/drum | l | 336 | drums | k | 273 | 0.14 | 0.75 |
| DSWEST2 | Drum Storage West 2 Fugitives | 24 | 8,760 | d | 4.2E-05 | kg/hr/drum | l | 1,244 | drums | k | 1,009 | 0.50 | 2.8 |
| ZONE6 | Zone 6 Tank Area | 24 | 8,760 | d | 1,691 | lbs/year | e | - | - | - | 1,691 | 0.85 | 4.6 |
| ZONE7B | Zone 7b Tank Area | 24 | 8,760 | d | 780 | lbs/year | e | - | - | - | 780 | 0.39 | 2.1 |
| ZONE8 | Zone 8 Tank Area | 24 | 8,760 | d | 4,359 | lbs/year | e | - | - | - | 4,359 | 2.2 | 11.9 |
| ZONE10 | Zone 10 Tank Area | 24 | 8,760 | d | 642 | lbs/year | e | - | - | - | 642 | 0.32 | 1.8 |
| TRCKWASH | Truck Washing | - | - | m | - | - | m | - | - | m | 0 | 0 | 0 |
| IWTS | Inorganic Waste Treatment System | 10 | 3,650 | a | 0.26 | lb/hr | n | - | - | - | 939 | 0.47 | 2.6 |

**Notes:**

g = gram
gal = gallons
Hrs = Hours
kg = kilogram
lbs = pounds
ppm = parts per million
Yr = Year

[a] The hours of operation information was obtained from Site personnel (see E-mail from Mary Cavendish to Stacy Mann dated 3/25/99). The drum liquefaction, consolidation, and fueling station operate 10 hours per day, five days a week. Although there are times when they have operated seven days per week so these sources will be assumed to be operating seven days per week.

[b] The volatile organic compound (VOC) concentration was estimated in the exit stream based on the average value of Site-provided organic vapor analyzer (OVA) concentration measurements.

[c] Exit flow rate from the stack was calculated based on Site-measured exit velocity and diameter of the stack.

[d] This source emits continuously.

[e] The annual VOC emission factor was estimated using the United States Environmental Protection Agency (USEPA) TANKS program.

[f] A control efficiency of 95% was estimated by Site personnel Carol Bonner and John Arden (9/9/99).

[g] It was assumed that 1 lb of VOC per day is emitted from the consolidation area (estimated by Carol Bonner and provided to ENVIRON at meeting on July 14, 1999).

[h] An evaporation loss factor of 1% was assumed for the diesel used at the Drum Liquefaction unit (Tidy Bowl).

[i] According to Site personnel, approximately 50 gallons of diesel are used per day. It was assumed that this source operates seven days per week, 52 weeks per year.

[j] Emission factor was derived using Site-provided VOC concentration readings (VOC measurements were conducted in November and December 1999) and information from USEPA guidance Protocol for Equipment Leak Emission Estimates. (EPA-453/R-95-017. November, 1995.)

[k] The number of drums stored in each storage area was obtained from the updated RCRA Part B Application.

[l] Emission factor was assumed to be similar to the total organic compound emission factor for fittings (connectors and flanges) of equipment containing gaseous material at a marketing terminal (see Table 2.3 in the United States Environmental Protection Agency document titled Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017. November, 1995)).

[m] The updated RCRA Part B Application proposes that only water and detergent will be used in these operations. Therefore, the emissions associated with this source in the Draft HRA will no longer exis

[n] Particulates emission rate based on Best Available Control Technology (BACT) standard for baghouses in similar service in the Bay Area Air Quality Management District (BAAQMD). Reviewing the BACT determinations on the BAAQMD website (www.baaqmd.gov/permit/bactworkbook/), it appears that this level is 0.006 grains per dry standard cubic feet. This is the BACT level for a baghouse at a cement facility.

**Table 5**
**Inorganic Waste Treatment System Emissions Estimates**
**Romic Facility**
**East Palo Alto, California**

| Metal | Mean Concentration in Cement Kiln Dust[b] (mg/kg) | Emission Rate[c] (g/s) |
|---|---|---|
| Antimony | 11.5 | 9.31E-06 |
| Arsenic | 14.1 | 1.14E-05 |
| Barium | 181 | 1.47E-04 |
| Beryllium | 1.03 | 8.34E-07 |
| Cadmium | 9.7 | 7.86E-06 |
| Chromium | 31.2 | 2.53E-05 |
| Lead[a] | 113 | 9.15E-05 |
| Mercury | 0.33 | 2.67E-07 |
| Nickel | 19.9 | 1.61E-05 |
| Selenium | 12.2 | 9.88E-06 |
| Silver | 5.9 | 4.78E-06 |
| Thallium | 33.5 | 2.71E-05 |

**Notes:**

g = gram
mg = milligram
kg = kilogram
s = second

[a] The median value for lead is 113 mg/kg versus the mean of 287 mg/kg and the maximum is 2,620 mg/kg; it is likely that one very high sample has shifted the mean. Therefore, the median value was used to represent the typical lead content of cement kiln dust.

[b] United States Environmental Protection Agency (USEPA). 1998. Draft Technical Background Document on the Control of Fugitive Dust at Cement Manufacturing Facilities. Page 2-3. March 20.

[c] Particulates emission rate based on Best Available Control Technology (BACT) standard for baghouses in similar service in the Bay Area Air Quality Management District (BAAQMD). Reviewing the BACT determinations on the BAAQMD website (www.baaqmd.gov/permit/bactworkbook/), it appears that this level is 0.006 grains per dry standard cubic feet. This is the BACT level for a baghouse at a cement facility.

# Table 6
# Point Source Parameters
# Romic Facility
# East Palo Alto, California

| Model ID | Source Description | UTM X[a,b] | UTM Y[a,b] | Stack Height (m) | | Temperature (K) | | Exit Velocity (m/s) | | Diameter (m) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CONS | Solids Consolidation | 577,090.25 | 4,147,952.86 | 3.66 | c | 293 | d | 18.03 | e | 0.40 | c |
| IWTS | Inorganic Waste Treatment System | 577,090.00 | 4,147,864.20 | 9.14 | f | 293 | d | 14.37 | g | 0.46 | f |

**Notes:**

cfm = cubic feet per minute    m = meter
K = degrees Kelvin    s = second

[a] Assume CONS stack is in center of the new building at north end of the facility.

[b] Assume IWTS stack is on corner of building BDW#4 in 2001 HRA Table 5.3.

[c] Personal communication between Wayne Kiso/Romic and Sarah Pye/ENVIRON on May 14, 2003.

[d] Assumed exit gas is at ambient temperature.

[e] Estimated based on flow rate of 4,800 cfm provided in RCRA Part B Application (p. e-60) and 0.40 meter stack diameter.

[f] Personal communication between Wayne Kiso/Romic and Sarah Pye/ENVIRON on May 14, 2003.

[g] Estimated based on 0.46 meter stack diameter and flow rate of 5,000 cfm provided in personal communication between Wayne Kiso/Romic and Sarah Pye/ENVIRON on May 13, 2003.

# Table 7
## Parameters Used to Calculate Average Concentrations in Soil Due to Deposition
## Romic Facility
## East Palo Alto, California

| Parameter | Units | Value | Notes |
|---|---|---|---|
| Deposition Rate | meters / second | 0.02 | b |
| Soil Half-Life[a] | days | 1.0E+06 | b |
| Soil Elimination Constant | $days^{-1}$ | 6.9E-07 | |
| Evaluation Period | days | 25,550 | c |
| Soil Mixing Depth | meters | 0.01 | b |
| Bulk Density | kilograms / cubic meter | 1,500 | d |
| X | days | 224.9 | |
| $C_s$/GLC | cubic meters / kilogram | 1.5E+06 | |

Notes:

[a] All chemicals evaluated for deposition had the same soil half-life.

[b] California Air Pollution Control Officers Association (CAPCOA). 1993. *Air Toxics "Hot Spots" Program. Revised 1992 Risk Assessment Guidelines.* October.

[c] Evaluation period was selected to evaluate the mass in soil due to a 70 year deposition period.

[d] California Environmental Protection Agency (Cal/EPA). 1994. *Preliminary Endangerment Assessment Guidance Manual.* Department of Toxic Substances Control (DTSC). January.

**Table 8**
**Estimated Metal Concentrations in Air and Soil from Stabilization Operations**
**Romic Facility**
**East Palo Alto, California**

| Chemical | Resident | | Worker | |
|---|---|---|---|---|
| | Maximum Air Concentration ($mg/m^3$) | Maximum Soil Concentration (mg/kg) | Maximum Air Concentration ($mg/m^3$) | Maximum Soil Concentration (mg/kg) |
| Antimony | 4.16E-10 | 6.09E-04 | 2.96E-09 | 4.33E-03 |
| Arsenic | 5.10E-10 | 7.46E-04 | 3.63E-09 | 5.30E-03 |
| Barium | 6.55E-09 | 9.58E-03 | 4.65E-08 | 6.81E-02 |
| Beryllium | 3.73E-11 | 5.45E-05 | 2.65E-10 | 3.87E-04 |
| Cadmium | 3.51E-10 | 5.13E-04 | 2.49E-09 | 3.65E-03 |
| Chromium (III) | 1.13E-09 | 1.65E-03 | 8.02E-09 | 1.17E-02 |
| Lead | 4.09E-09 | 5.98E-03 | 2.91E-08 | 4.25E-02 |
| Mercury | 1.19E-11 | 1.75E-05 | 8.49E-11 | 1.24E-04 |
| Nickel | 7.20E-10 | 1.05E-03 | 5.12E-09 | 7.49E-03 |
| Selenium | 4.41E-10 | 6.46E-04 | 3.14E-09 | 4.59E-03 |
| Silver | 2.13E-10 | 3.12E-04 | 1.52E-09 | 2.22E-03 |
| Thallium | 1.21E-09 | 1.77E-03 | 8.61E-09 | 1.26E-02 |

## Table 9
## Drum Liquefaction Emissions Estimates
## Romic Facility
## East Palo Alto, California

| Parameter | Value | Unit | Notes |
|---|---|---|---|
| ***Scrubber System:*** | | | |
| Concentration of exit stream | 306.5 | ppm | a |
| Flow rate of exhuast | 0.00079 | $m^3/s$ | b |
| Molecular weight of emissions | 65.4 | g/mole | c |
| Time period | 3650 | hours/year | d |
| Annual VOC emissions | 0.009 | tons/year | -- |
| ***Fugitive Emissions:*** | | | |
| Diesel throughput | 50 | gal/day | e |
| | 18,200 | gal/year | f |
| Density of diesel | 7.1 | lb/gal | g |
| Loss fraction | 1% | -- | h |
| Annual VOC emissions | 0.65 | tons/year | -- |

**Notes:**

lb = pound
ppm = parts per million
$m^3/s$ = cubic meters per second
VOC = volatile organic compound
g = gram
gal = gallon

[a] See Table C.18a in the HRA for estimation of this concentration based on organic vapor analyzer (OVA) readings of scrubber exhaust.

[b] Exit flow rate from the stack was calculated based on facility-measured exit velocity and diameter of the stack.

[c] Weighted average molecular weight of the organic vapor stream.

[d] Assumed the unit runs 10 hours per day, seven days per week although it typically only runs five days per week.

[e] Facility estimate

[f] Assumes seven days per week, 52 weeks per year

[g] TANKS database for Distillate Fuel Oil No. 2

[h] Assumption from the HRA (October 9, 2001)

## Table10
## Estimated Aerosol Can Product Compositions
## Romic Facility
## East Palo Alto, California

| Chemical Type | Chemical | Composition (weight percent) | | | |
|---|---|---|---|---|---|
| | | Rust-Oleum Spray Paint | Premium Décor Spray Enamel | WD-40 | Moly Dry Lube |
| Non-propellant | Acetone | --- | --- | --- | --- |
| | 2-Butoxyethanol | 5% | --- | --- | --- |
| | Copper | --- | 4% | --- | --- |
| | Ethanol | --- | --- | --- | 10% |
| | Ethylbenzene | 2.5% | --- | --- | --- |
| | Isopropyl alcohol | --- | --- | --- | 5% |
| | Methyl ethyl ketone | 1.5% | --- | --- | --- |
| | Molybdenum disulfide | --- | --- | --- | 5% |
| | Napththa (light aliphatic solvent) | 2.5% | --- | 50% | --- |
| | Oil | --- | --- | 15% | --- |
| | Propanol | 1% | --- | --- | --- |
| | Propylene glycol n-butyl ether | --- | --- | --- | 5% |
| | Toluene | 17.5% | 37.5% | --- | --- |
| | Xylene | 22.5% | --- | --- | --- |
| Propellant[a] | Propane/butane/isobutane) | 25% | 30% | --- | --- |
| | 1,1-Difluoroethane | --- | --- | --- | 27.5% |
| | Liquefied petroleum gas (LPG) | --- | --- | 25% | --- |
| Average Maximum Throughput (cans/day) | | 50 | 50 | 50 | 50 |
| Total mass of material in can (lb) | | 0.94 | 0.75 | 0.69 | 0.75 |
| Control efficiency | | 95% | 95% | 95% | 95% |
| VOC emissions by can type (lb/day) | | 0.59 | 0.56 | 0.43 | 0.52 |
| Total VOC emission from source (lb/day) | | 2.09 | | | |

**Notes:**
lb = pound
VOC = volatile organic compound

[a] Propellants are assumed to be the only materials that would be emitted from this source. Negligible quantities of the other components in the can may be emitted but these emissions are expected to be minimal.

# Table 11
# Aerosol Can Depresurization Volume Source Parameters
# Romic Facility
# East Palo Alto, California

| Source Description | UTM X[a,b] | UTM Y[a,b] | Release Height (m) | | Initial Lateral Dimension (m) | | Initial Vertical Dimension (m) | | 1,1-Difluoroethane Emission Rate (g/s) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Aerosol can depressurization - North building | 577,086.52 | 4,147,936.42 | 3.81 | a | 6.04 | a | 0.40 | a | 0.049 | c |
| Aerosol can depressurization - South building | 577,094.40 | 4,147,918.60 | 3.81 | b | 8.39 | b | 0.46 | b | 0.016 | d |

**Notes:**
m = meter
g = gram
s = second

[a] Assume aerosol can depressurization in the north building has the same volume source parameters as the consolidation source in the Draft HRA.

[b] Assume aerosol can depressurization in the south building has the same volume source parameters as the drum storage south source in the Draft HRA.

[c] Based on daily 1,1-difluorethane emission rate in Table 9. Conservatively assumes that all aerosol can depressurization takes place during in a single hour. Assumes 75% of aerosol can depressurization occurs in the north building.

[d] Based on daily 1,1-difluorethane emission rate in Table 9. Conservatively assumes that all aerosol can depressurization takes place during in a single hour. Assumes 25% of aerosol can depressurization occurs in the south building.

# Table 12
## Exposure Assumptions -- Metals Evaluation
## Romic Facility
## East Palo Alto, California

| Parameter | Commercial Worker | | Adult Resident | | Child Resident | |
|---|---|---|---|---|---|---|
| | Potentially Exposed Populations | | | | | |
| **Inhalation of Soil Particulates** | | | | | | |
| Inhalation Rate ($m^3$/hour) | 2.5 | a | 0.83 | a | 0.42 | b |
| Exposure Time (hours/day) | 8 | c | 24 | c | 24 | c |
| Inhalation Rate ($m^3$/day) | 20 | a | 20 | a | 10 | b |
| **Ingestion of Soil** | | | | | | |
| Ingestion Rate (mg/day) | 50 | a | 100 | a | 200 | a |
| Conversion Factor (kg/mg) | 1.00E-06 | | 1.00E-06 | | 1.00E-06 | |
| **Dermal Contact with Soil** | | | | | | |
| Surface Area ($cm^2$/day) | 5,700 | d | 5,700 | d | 2,900 | d |
| Adherence Factor (mg/$cm^2$) | 0.2 | d | 0.07 | d | 0.2 | d |
| Conversion Factor (kg/mg) | 1.00E-06 | | 1.00E-06 | | 1.00E-06 | |
| **Population-Specific Assumptions** | | | | | | |
| Exposure Frequency (days/year) | 250 | a | 350 | a | 350 | a |
| Exposure Duration (years) | 25 | a | 30 | a | 6 | a |
| Exposure Duration - Age-Adjusted (years) | NA | | 24 | e | 6 | a |
| Body Weight (kg) | 70 | a | 70 | a | 15 | a |
| Averaging Time - Carcinogens (days) | 25,500 | | 25,550 | | 25,550 | |
| Averaging Time - Noncarcinogens (days) | 9,125 | | 10,950 | | 2,190 | |

Notes:
NA = Not Applicable.
$m^3$ = cubic meters
mg = milligram
kg = kilogram
cm = centimeter

a CalEPA (1992).
b CalEPA (1994).
c Residential exposure times were taken from USEPA (1991).
d CalEPA (2000).
e For carcinogens, the 30 year residential exposure duration is divided into 6 years of exposure as a 15-kg child and 24 years of exposure as an 70-kg adult.

Sources:

California Environmental Protection Agency (CalEPA). 1992. *Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities*. *Sacramento, California. July.*

California Environmental Protection Agency (CalEPA). 1994. *Preliminary Endangerment Assessment Manual*. Sacramento, California. January.

California Environmental Protection Agency (CalEPA). 2000. *Guidance of the Dermal Exposure Pathway*. Memorandum to Human and Ecological Risk Division. January 7 (Draft).

United States Environmental Protection Agency (USEPA). 1991. *Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors"*. Office of Solid Waste and Emergency Response (OSWER). OSWER Directive 9285.6-03. March 25.

**Table 13**
**Dermal Absorption Fraction from Soil -- Metals Evaluation**
**Romic Facility**
**East Palo Alto, California**

| Chemical | Soil Absorption Factor (unitless) | Source |
|---|---|---|
| **Metals** | | |
| Antimony | 0.01 | a |
| Arsenic | 0.03 | a |
| Barium | 0.01 | a |
| Beryllium | 0.01 | a |
| Cadmium | 0.001 | a |
| Chromium (III) | 0.01 | a |
| Mercury | 0.01 | a |
| Nickel | 0.01 | a |
| Selenium | 0.01 | a |
| Silver | 0.01 | a |
| Thallium | 0.01 | a |

Notes:
a CalEPA 1994.

Sources:
California Environmental Protection Agency (Cal/EPA). 1994. *Preliminary Endangerment Assessment Manual* . Sacramento, California. January.

**Table 14**
**Carcinogenic and Noncarcinogenic Toxicity Data -- Metals Evaluation**
**Romic Facility**
**East Palo Alto, California**

| Chemical | CAS # | Toxicity Values | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cancer Slope Factor (CSF) $(mg/kg\text{-}day)^{-1}$ | | | | USEPA Weight of Evidence | Noncancer Reference Dose (RfD) mg/kg-day | | | |
| | | Inhalation | Source | Oral | Source | | Inhalation | Source | Oral | Source |
| **Metals** | | | | | | | | | | |
| Antimony | 7440360 | ---- | | ---- | | ---- | ---- | | 4.00E-04 | IRIS |
| Arsenic | 7440382 | 1.20E+01 | Cal/EPA 2003 | 1.50E+00 | Cal/EPA 2003 | A | 8.57E-06 | Cal/EPA 2002 | 3.00E-04 | IRIS |
| Barium | 7440393 | ---- | | ---- | | D | 1.43E-04 | HEAST | 7.00E-02 | IRIS |
| Beryllium | 7440417 | 8.40E+00 | Cal/EPA 2003 | ---- | | B1(inh) | 2.00E-06 | Cal/EPA 2002 | 2.00E-03 | IRIS |
| Cadmium | 7440439 (Food) | 1.50E+01 | Cal/EPA 2003 | ---- | | B1 | 5.71E-06 | Cal/EPA 2002 | 1.00E-03 | IRIS |
| Chromium (III) | 16065831 | ---- | | ---- | | ---- | ---- | | 1.50E+00 | IRIS |
| Mercury | Mercury (inorganic) | ---- | | ---- | | D | 2.57E-05 | Cal/EPA 2002 | ---- | |
| Nickel | 7440020 | 9.10E-01 | Cal/EPA 2003 | ---- | a | A | 1.43E-05 | Cal/EPA 2002 | 2.00E-02 | IRIS (b) |
| Selenium | 7782492 | ---- | | ---- | | D | 5.71E-03 | Cal/EPA 2002 | 5.00E-03 | IRIS |
| Silver | 7440224 | ---- | | ---- | | D | ---- | | 5.00E-03 | IRIS |
| Thallium | 7440280 | ---- | | ---- | | D | ---- | | 6.60E-05 | Region 9 PRGs |

Notes:
CalEPA = California Environmental Protection Agency
HEAST = Health Effects Assessment Summary Tables (USEPA 1997)
IRIS = Integrated Risk Information System (USEPA 2003)
PRGs = Preliminary Remediaton Goals (USEPA 2002)
USEPA = United States Environmental Protection Agency

a This chemical is not a known carcinogen via the oral route.
b Listed value is for Nickel (soluble salts).

Sources:

California Environmental Protection Agency (CalEPA). 2002. *All Chronic Reference Exposure Levels Adopted by Office of Environmental Health Hazard Assessment (OEHHA)* . September.
California Environmental Protection Agency (CalEPA). 2003. *California Cancer Potency Values.* Office of Environmental Health Hazard Assessment. January 30.
United States Environmental Protection Agency (USEPA). 1997. Health Effects Assessment Summary Tables (HEAST). FY 1997 Update. EPA 540-R-97-036. Office of Solid Waste and Emergency Response. Washington, D.C. July.
United States Environmental Protection Agency (USEPA). 2002. USEPA Region 9 Preliminary Remediation Goals (PRGs) 2002. San Francisco, CA. October.
United States Environmental Protection Agency (USEPA). 2003. *Integrated risk information system (IRIS)* . Online database maintained by the USEPA. Cincinnati, OH. January.

## Table 15
## Cancer Risks and Noncancer Hazard Indices -- Residents -- Metals Evaluation
## Romic Facility
## East Palo Alto, California

| Chemical | Cancer Risk | | | | Noncancer Hazard | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Age-Adjusted Resident | | | | Adult Resident | | | | Child Resident | | | |
| | Inhalation of Ambient Air | Ingestion of Soil | Dermal Contact with Soil | Risk by Chemical | Inhalation of Ambient Air | Ingestion of Soil | Dermal Contact with Soil | Hazard Quotient | Inhalation of Ambient Air | Ingestion of Soil | Dermal Contact with Soil | Hazard Quotient |
| **Metals** | | | | | | | | | | | | |
| Antimony | ---- | ---- | ---- | ---- | NA | 2.08E-06 | 8.32E-08 | 2.17E-06 | NA | 1.95E-05 | 5.64E-07 | 2.00E-05 |
| Arsenic | 9.10E-10 | 1.75E-09 | 1.70E-10 | 2.83E-09 | 1.63E-05 | 3.41E-06 | 4.08E-07 | 2.01E-05 | 3.80E-05 | 3.18E-05 | 2.77E-06 | 7.26E-05 |
| Barium | ---- | ---- | ---- | ---- | 1.25E-05 | 1.87E-07 | 7.48E-09 | 1.27E-05 | 2.93E-05 | 1.75E-06 | 5.07E-08 | 3.11E-05 |
| Beryllium | 4.65E-11 | ---- | ---- | 4.65E-11 | 5.10E-06 | 3.73E-08 | 1.49E-09 | 5.14E-06 | 1.19E-05 | 3.48E-07 | 1.01E-08 | 1.23E-05 |
| Cadmium | 7.83E-10 | ---- | ---- | 7.83E-10 | 1.68E-05 | 7.03E-07 | 2.81E-09 | 1.75E-05 | 3.93E-05 | 6.56E-06 | 1.90E-08 | 4.59E-05 |
| Chromium (III) | ---- | ---- | ---- | ---- | NA | 1.51E-09 | 6.02E-11 | 1.57E-09 | NA | 1.41E-08 | 4.08E-10 | 1.45E-08 |
| Mercury | ---- | ---- | ---- | ---- | 1.27E-07 | NA | NA | 1.27E-07 | 2.97E-07 | NA | NA | 2.97E-07 |
| Nickel | 9.74E-11 | ---- | ---- | 9.74E-11 | 1.38E-05 | 7.21E-08 | 2.88E-09 | 1.39E-05 | 3.22E-05 | 6.73E-07 | 1.95E-08 | 3.29E-05 |
| Selenium | ---- | ---- | ---- | ---- | 2.12E-08 | 1.77E-07 | 7.06E-09 | 2.05E-07 | 4.94E-08 | 1.65E-06 | 4.79E-08 | 1.75E-06 |
| Silver | ---- | ---- | ---- | ---- | NA | 8.55E-08 | 3.41E-09 | 8.90E-08 | NA | 7.98E-07 | 2.32E-08 | 8.22E-07 |
| Thallium | ---- | ---- | ---- | ---- | NA | 3.68E-05 | 1.47E-06 | 3.83E-05 | NA | 3.43E-04 | 9.96E-06 | 3.53E-04 |
| **Risk or Hazard by Pathway** | 1.84E-09 | 1.75E-09 | 1.70E-10 | | 6.47E-05 | 4.36E-05 | 1.98E-06 | | 1.51E-04 | 4.06E-04 | 1.35E-05 | |
| **Cumulative Risk or Hazard Quotient** | | | | 3.76E-09 | | | | 1.10E-04 | | | | 5.71E-04 |

Notes:
---- = Not evaluated because chemical is not classified as a carcinogen.
NA = Not available. Toxicity factor not available for this chemical.

## Table 16
## Cancer Risks and Noncancer Hazard Indices -- Workers -- Metals Evaluation
## Romic Facility
## East Palo Alto, California

| Chemical | Cancer Risk | | | | Noncancer Hazard | | | |
|---|---|---|---|---|---|---|---|---|
| | **Inhalation of Ambient Air** | **Ingestion of Soil** | **Dermal Contact with Soil** | **Risk by Chemical** | **Inhalation of Ambient Air** | **Ingestion of Soil** | **Dermal Contact with Soil** | **Hazard Quotient** |
| **Metals** | | | | | | | | |
| Antimony | ---- | ---- | ---- | ---- | NA | 5.29E-06 | 1.21E-06 | 6.50E-06 |
| Arsenic | 3.05E-09 | 1.39E-09 | 9.53E-10 | 5.39E-09 | 8.28E-05 | 8.65E-06 | 5.92E-06 | 9.74E-05 |
| Barium | ---- | ---- | ---- | ---- | 6.37E-05 | 4.76E-07 | 1.09E-07 | 6.43E-05 |
| Beryllium | 1.56E-10 | ---- | ---- | 1.56E-10 | 2.59E-05 | 9.48E-08 | 2.16E-08 | 2.60E-05 |
| Cadmium | 2.62E-09 | ---- | ---- | 2.62E-09 | 8.55E-05 | 1.79E-06 | 4.07E-08 | 8.73E-05 |
| Chromium (III) | ---- | ---- | ---- | ---- | NA | 3.83E-09 | 8.73E-10 | 4.70E-09 |
| Mercury | ---- | ---- | ---- | ---- | 6.46E-07 | NA | 0.00E+00 | 6.46E-07 |
| Nickel | 3.26E-10 | ---- | ---- | 3.26E-10 | 7.01E-05 | 1.83E-07 | 4.18E-08 | 7.03E-05 |
| Selenium | ---- | ---- | ---- | ---- | 1.08E-07 | 4.49E-07 | 1.02E-07 | 6.59E-07 |
| Silver | ---- | ---- | ---- | ---- | NA | 2.17E-07 | 4.95E-08 | 2.67E-07 |
| Thallium | ---- | ---- | ---- | ---- | NA | 9.34E-05 | 2.13E-05 | 1.15E-04 |
| **Risk or Hazard by Pathway** | 6.15E-09 | 1.39E-09 | 9.53E-10 | | 3.29E-04 | 1.11E-04 | 2.88E-05 | |
| **Cumulative Risk or Hazard Quotient** | | | | 8.49E-09 | | | | 4.68E-04 |

Notes:
---- = Not evaluated because chemical is not classified as a carcinogen.
NA = Not available. Toxicity factor not available for this chemical.

# Table 17
# Maximum Hourly Average Concentration
# - Metals Evaluation
# Romic Facility
# East Palo Alto, California

| Chemical | Maximum Hourly Average Concentration (µg/m$^3$) | Acute Reference Exposure Level (µg/m$^3$) | Ratio |
|---|---|---|---|
| Antimony | 1.90E-04 | ---- | ---- |
| Arsenic | 2.30E-04 | 1.90E-01 | 1.21E-03 |
| Barium | 3.00E-03 | ---- | ---- |
| Beryllium | 1.70E-05 | ---- | ---- |
| Cadmium | 1.60E-04 | ---- | ---- |
| Chromium | 5.20E-04 | ---- | ---- |
| Lead | 1.90E-03 | ---- | ---- |
| Mercury | 5.50E-06 | 1.80E+00 | 3.06E-06 |
| Nickel | 3.30E-04 | 6.00E+00 | 5.50E-05 |
| Selenium | 2.00E-04 | ---- | ---- |
| Silver | 9.80E-05 | ---- | ---- |
| Thallium | 5.50E-04 | ---- | ---- |
| | | Total Acute HI: | 0.001 |

**Table 18**
**Summary of Revised Human Health Impacts at 2001 HRA**
**Reasonable Maximum Exposure (RME) -- Residents and Workers -- Future**
**Romic Facility**
**East Palo Alto, California**

| Population | Cancer Risk | | | Adult Chronic Hazard Index | | | Child Chronic Hazard Index | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2001 HRA | HRA Addendum | Percent Change | 2001 HRA | HRA Addendum | Percent Change | 2001 HRA | HRA Addendum | Percent Change |
| Resident | 3.1E-06 | 2.5E-06 | -21% | 0.023 | 0.020 | -15% | 0.054 | 0.046 | -15% |
| Worker | 7.0E-06 | 5.0E-06 | -28% | 0.062 | 0.047 | -25% | --- | --- | --- |

# Table 19

## Estimated RME Cancer Risks -- Maximum Residential Receptor[a] by Emission Source
## Romic Facility
## East Palo Alto, California

| Chemical | Revised Emission Sources | | | | | | | | | Total Revised Risk | Total 2001 HRA Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Drum Liquefaction | Solid Waste Consolidation | Drum Storage | Tank Farm A (Zone 6) | Tank Farms H and T (Zone 7b) | Tank Farm Q (Zone 8) | Tank Farm D (Zone 10) | Tank Farm F | Truck Washing | | |
| 1,2-Dichloroethane | 1.5E-11 | 2.7E-10 | 1.3E-08 | 5.8E-09 | 1.7E-09 | 8.0E-09 | 1.3E-09 | 6.5E-12 | 0.0E+00 | 6.4E-08 | 7.8E-08 |
| 1,4-Dioxane | 3.2E-12 | 5.8E-11 | 2.8E-09 | 8.0E-10 | 2.3E-10 | 1.1E-09 | 1.9E-10 | 8.9E-13 | 0.0E+00 | 1.0E-08 | 1.3E-08 |
| 2-Nitropropane | 1.3E-10 | 2.4E-09 | 1.2E-07 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.0E-07 | 3.1E-07 |
| Acrylonitrile | 4.1E-12 | 7.4E-11 | 3.7E-09 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 6.1E-09 | 9.3E-09 |
| Benzene | 1.2E-10 | 2.1E-09 | 1.1E-07 | 4.7E-08 | 1.4E-08 | 6.5E-08 | 1.1E-08 | 5.3E-11 | 0.0E+00 | 5.1E-07 | 6.2E-07 |
| Carbon tetrachloride | 2.5E-11 | 4.6E-10 | 2.3E-08 | 1.4E-08 | 4.2E-09 | 2.0E-08 | 3.3E-09 | 1.6E-11 | 0.0E+00 | 1.4E-07 | 1.7E-07 |
| Chloroform | 8.1E-11 | 1.5E-09 | 7.3E-08 | 2.6E-08 | 7.6E-09 | 3.6E-08 | 6.0E-09 | 3.0E-11 | 0.0E+00 | 3.1E-07 | 3.8E-07 |
| Formaldehyde | 2.2E-11 | 4.0E-10 | 2.0E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.7E-08 | 5.4E-08 |
| Gasoline | 5.5E-11 | 1.0E-09 | 5.0E-08 | 6.2E-08 | 1.8E-08 | 8.8E-08 | 1.4E-08 | 7.2E-11 | 0.0E+00 | 5.3E-07 | 6.1E-07 |
| Hydrazine | 9.4E-11 | 1.7E-09 | 8.5E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.4E-07 | 2.1E-07 |
| Methylene chloride | 1.0E-10 | 1.8E-09 | 9.1E-08 | 3.8E-08 | 1.1E-08 | 5.4E-08 | 8.8E-09 | 4.4E-11 | 0.0E+00 | 4.3E-07 | 5.3E-07 |
| Propylene oxide | 6.6E-12 | 1.2E-10 | 5.9E-09 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.9E-09 | 1.5E-08 |
| Tetrachloroethene | 5.7E-12 | 1.0E-10 | 5.2E-09 | 1.8E-09 | 5.1E-10 | 2.5E-09 | 4.2E-10 | 2.0E-12 | 0.0E+00 | 2.1E-08 | 2.7E-08 |
| Trichloroethene | 1.1E-11 | 2.0E-10 | 9.9E-09 | 3.9E-09 | 1.1E-09 | 5.4E-09 | 9.0E-10 | 4.3E-12 | 0.0E+00 | 4.4E-08 | 5.5E-08 |
| Urethane | 1.3E-11 | 2.4E-10 | 1.2E-08 | 4.1E-10 | 1.1E-10 | 5.5E-10 | 9.6E-11 | 4.2E-13 | 0.0E+00 | 2.3E-08 | 3.3E-08 |
| Vinyl chloride | 4.1E-13 | 7.4E-12 | 3.7E-10 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 6.1E-10 | 9.3E-10 |
| **Revised Total for Source** | 6.9E-10 | 1.3E-08 | 6.2E-07 | 2.0E-07 | 5.9E-08 | 2.8E-07 | 4.6E-08 | 2.3E-10 | 0.0E+00 | 2.5E-06 | |
| **2001 HRA Total for Source** | 0.0E+00 | 1.5E-08 | 5.8E-07 | 7.6E-07 | 5.8E-08 | 4.1E-07 | 2.3E-08 | 1.6E-11 | 8.8E-09 | | 3.1E-06 |

**Notes:**
RME = reasonable maximum exposure

[a] Maximum residential receptor location as identified in the 2001 HRA.

# Table 20
## Estimated RME Cancer Risks -- Maximum Worker Receptor[a] by Emission Source
## Romic Facility
## East Palo Alto, California

| Chemical | Revised Emission Source | | | | | | | | | Total Revised Risk | Total 2001 HRA Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Drum Liquefaction | Solid Waste Consolidation | Drum Storage | Tank Farm A (Zone 6) | Tank Farms H and T (Zone 7b) | Tank Farm Q (Zone 8) | Tank Farm D (Zone 10) | Tank Farm F | Truck Washing | | |
| 1,2-Dichloroethane | 7.3E-12 | 5.1E-11 | 1.6E-08 | 1.9E-08 | 3.7E-09 | 1.5E-08 | 3.1E-09 | 8.1E-12 | 0.0E+00 | 1.3E-07 | 1.8E-07 |
| 1,4-Dioxane | 1.6E-12 | 1.1E-11 | 3.3E-09 | 2.6E-09 | 5.2E-10 | 2.1E-09 | 4.3E-10 | 1.1E-12 | 0.0E+00 | 2.1E-08 | 3.0E-08 |
| 2-Nitropropane | 6.6E-11 | 4.6E-10 | 1.4E-07 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.3E-07 | 6.7E-07 |
| Acrylonitrile | 2.0E-12 | 1.4E-11 | 4.3E-09 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.9E-09 | 2.1E-08 |
| Benzene | 5.7E-11 | 4.0E-10 | 1.2E-07 | 1.5E-07 | 3.0E-08 | 1.2E-07 | 2.5E-08 | 6.6E-11 | 0.0E+00 | 1.1E-06 | 1.4E-06 |
| Carbon tetrachloride | 1.3E-11 | 8.8E-11 | 2.7E-08 | 4.6E-08 | 9.3E-09 | 3.7E-08 | 7.7E-09 | 2.0E-11 | 0.0E+00 | 3.0E-07 | 3.8E-07 |
| Chloroform | 4.0E-11 | 2.8E-10 | 8.6E-08 | 8.4E-08 | 1.7E-08 | 6.8E-08 | 1.4E-08 | 3.7E-11 | 0.0E+00 | 6.3E-07 | 8.6E-07 |
| Formaldehyde | 1.1E-11 | 7.5E-11 | 2.3E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 5.3E-08 | 1.1E-07 |
| Gasoline | 2.7E-11 | 1.9E-10 | 5.9E-08 | 2.0E-07 | 4.1E-08 | 1.6E-07 | 3.3E-08 | 9.0E-11 | 0.0E+00 | 1.2E-06 | 1.4E-06 |
| Hydrazine | 4.6E-11 | 3.2E-10 | 1.0E-07 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.3E-07 | 4.7E-07 |
| Methylene chloride | 5.0E-11 | 3.5E-10 | 1.1E-07 | 1.2E-07 | 2.5E-08 | 1.0E-07 | 2.1E-08 | 5.5E-11 | 0.0E+00 | 8.8E-07 | 1.2E-06 |
| Propylene oxide | 3.2E-12 | 2.3E-11 | 7.0E-09 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.6E-08 | 3.3E-08 |
| Tetrachloroethene | 2.8E-12 | 2.0E-11 | 6.1E-09 | 5.8E-09 | 1.1E-09 | 4.6E-09 | 9.7E-10 | 2.5E-12 | 0.0E+00 | 4.3E-08 | 6.0E-08 |
| Trichloroethene | 5.4E-12 | 3.8E-11 | 1.2E-08 | 1.3E-08 | 2.5E-09 | 1.0E-08 | 2.1E-09 | 5.4E-12 | 0.0E+00 | 9.0E-08 | 1.2E-07 |
| Urethane | 6.6E-12 | 4.6E-11 | 1.4E-08 | 1.3E-09 | 2.5E-10 | 1.0E-09 | 2.2E-10 | 5.3E-13 | 0.0E+00 | 3.9E-08 | 7.4E-08 |
| Vinyl chloride | 2.0E-13 | 1.4E-12 | 4.3E-10 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.9E-10 | 2.0E-09 |
| **Revised Total for Source** | 3.4E-10 | 2.4E-09 | 7.3E-07 | 6.5E-07 | 1.3E-07 | 5.2E-07 | 1.1E-07 | 2.9E-10 | 0.0E+00 | 5.0E-06 | |
| **2001 HRA Total for Source** | 0.0E+00 | 5.8E-09 | 6.7E-07 | 2.5E-06 | 1.3E-07 | 7.7E-07 | 5.4E-08 | 2.0E-11 | 2.3E-08 | | 7.0E-06 |

**Notes:**
RME = reasonable maximum exposure

[a] Maximum worker receptor location as identified in the 2001 HRA.

## Table 21
## Comparison of Draft HRA and HRA Addendum Estimated Cancer Risks at Selected Locations[a]
## Romic Facility
## East Palo Alto, California

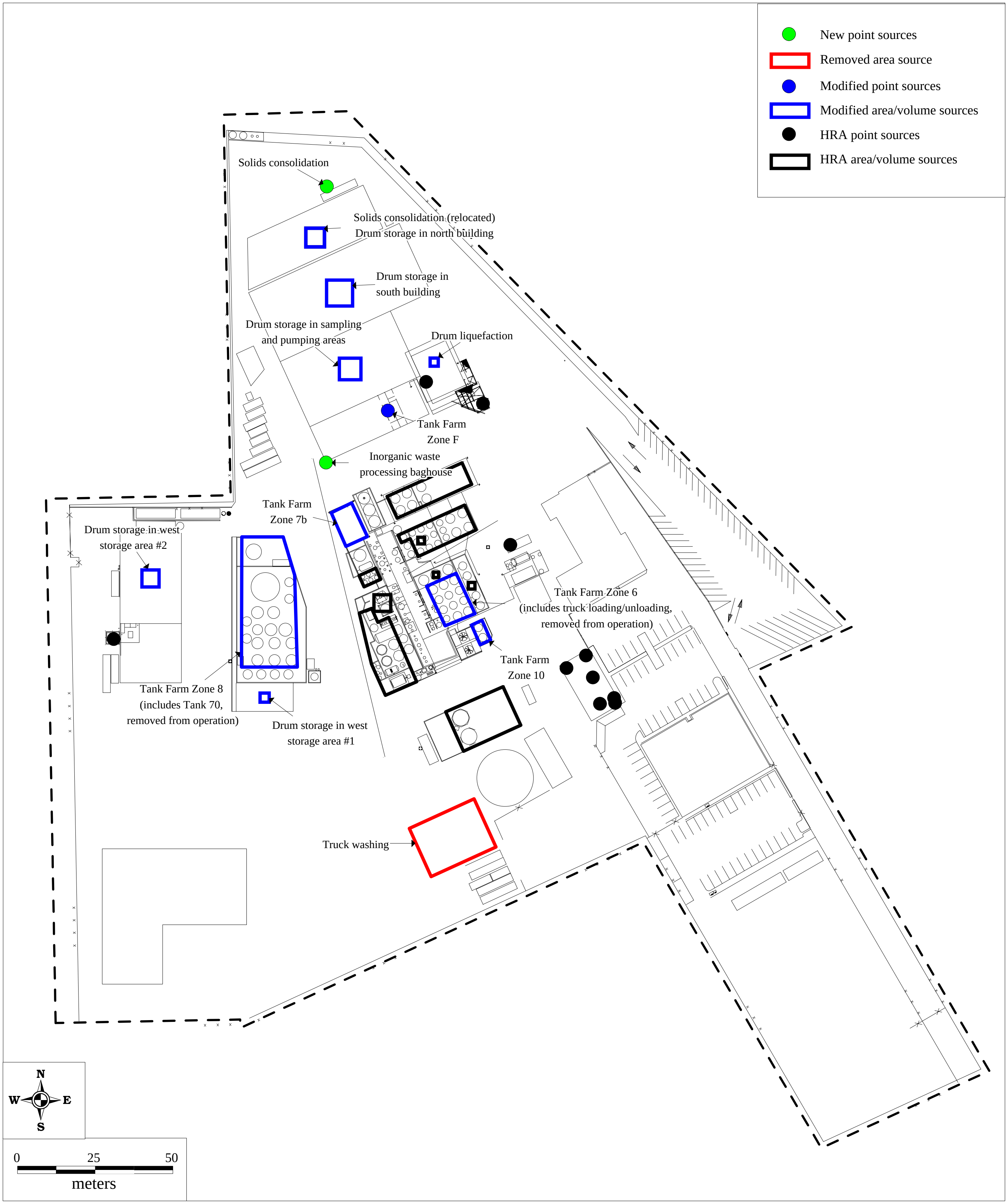
| Source Group | Estimated Cancer Risk | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hypothetical Resident #1 | | Hypothetical Resident #2 | | Hypothetical Resident #3 | | Hypothetical Resident #4 | | Hypothetical Resident #5 | | Hypothetical Resident #6 | | Hypothetical Resident #7 | |
| | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum | Draft HRA | HRA Addendum |
| Laboratory | 3.3E-08 | 3.3E-08 | 2.9E-08 | 2.9E-08 | 3.6E-08 | 3.6E-08 | 5.0E-08 | 5.0E-08 | 4.9E-08 | 4.9E-08 | 1.1E-07 | 1.1E-07 | 5.1E-08 | 5.1E-08 |
| Drum Liquefaction | 0 | 3.3E-09 | 0 | 2.8E-09 | 0 | 2.2E-09 | 0 | 1.4E-09 | 0 | 8.1E-10 | 0 | 1.5E-09 | 0 | 1.8E-09 |
| Lab Pack | 5.7E-09 | 5.7E-09 | 1.5E-08 | 1.5E-08 | 1.2E-08 | 1.2E-08 | 4.7E-10 | 4.7E-10 | 3.9E-10 | 3.9E-10 | 1.4E-09 | 1.4E-09 | 2.7E-09 | 2.7E-09 |
| Triple Scrubber/Boiler Emissions Abatement System | 2.9E-09 | 2.9E-09 | 1.9E-09 | 1.9E-09 | 4.7E-09 | 4.7E-09 | 2.5E-09 | 2.5E-09 | 1.4E-09 | 1.4E-09 | 1.7E-08 | 1.7E-08 | 1.1E-08 | 1.1E-08 |
| Bio System (Tank Farm K) | 3.5E-08 | 3.5E-08 | 2.9E-08 | 2.9E-08 | 3.4E-08 | 3.4E-08 | 4.3E-08 | 4.3E-08 | 4.1E-08 | 4.1E-08 | 7.3E-08 | 7.3E-08 | 3.5E-08 | 3.5E-08 |
| Drum Sampling | 1.5E-07 | 1.5E-07 | 1.2E-07 | 1.2E-07 | 7.1E-08 | 7.1E-08 | 5.4E-08 | 5.4E-08 | 3.6E-08 | 3.6E-08 | 4.9E-08 | 4.9E-08 | 5.8E-08 | 5.8E-08 |
| Consolidation | 1.0E-07 | 4.4E-08 | 7.7E-08 | 4.7E-08 | 3.5E-08 | 2.6E-08 | 4.3E-08 | 1.7E-08 | 2.9E-08 | 2.2E-08 | 2.7E-08 | 2.0E-08 | 3.2E-08 | 3.6E-08 |
| Fueling Station | 5.7E-08 | 5.7E-08 | 8.7E-08 | 8.7E-08 | 6.2E-08 | 6.2E-08 | 1.0E-08 | 1.0E-08 | 5.1E-09 | 5.1E-09 | 1.5E-08 | 1.5E-08 | 2.2E-08 | 2.2E-08 |
| Component Leaks | 1.5E-07 | 1.5E-07 | 1.1E-07 | 1.1E-07 | 1.0E-07 | 1.0E-07 | 2.6E-07 | 2.6E-07 | 2.2E-07 | 2.2E-07 | 2.5E-07 | 2.5E-07 | 1.1E-07 | 1.1E-07 |
| Drum Storage | 1.2E-06 | 1.3E-06 | 9.6E-07 | 1.0E-06 | 6.4E-07 | 6.7E-07 | 1.9E-06 | 2.0E-06 | 1.4E-06 | 1.5E-06 | 1.2E-06 | 1.3E-06 | 6.2E-07 | 6.6E-07 |
| Truck Sampling | 2.6E-08 | 2.6E-08 | 2.6E-08 | 2.6E-08 | 2.2E-08 | 2.2E-08 | 1.1E-08 | 1.1E-08 | 5.4E-09 | 5.4E-09 | 1.3E-08 | 1.3E-08 | 1.5E-08 | 1.5E-08 |
| Tank Farms I and J and Two Troughs | 7.9E-07 | 7.9E-07 | 6.2E-07 | 6.2E-07 | 6.2E-07 | 6.2E-07 | 8.8E-07 | 8.8E-07 | 6.9E-07 | 6.9E-07 | 1.3E-06 | 1.3E-06 | 6.7E-07 | 6.7E-07 |
| Tank Farms C, L, and R | 6.2E-07 | 6.2E-07 | 5.0E-07 | 5.0E-07 | 4.4E-07 | 4.4E-07 | 1.1E-06 | 1.1E-06 | 9.0E-07 | 9.0E-07 | 1.2E-06 | 1.2E-06 | 5.4E-07 | 5.4E-07 |
| Tank Farm A and Loading Area | 1.4E-06 | 3.7E-07 | 1.1E-06 | 2.9E-07 | 1.2E-06 | 3.0E-07 | 2.2E-06 | 5.8E-07 | 1.9E-06 | 4.9E-07 | 2.7E-06 | 7.0E-07 | 1.2E-06 | 3.2E-07 |
| Tank Farms MNO and U and Sieves | 4.7E-07 | 4.7E-07 | 3.8E-07 | 3.8E-07 | 3.1E-07 | 3.1E-07 | 8.9E-07 | 8.9E-07 | 7.7E-07 | 7.7E-07 | 8.6E-07 | 8.6E-07 | 3.9E-07 | 3.9E-07 |
| Tank Farms H and T | 1.3E-07 | 1.3E-07 | 1.0E-07 | 1.0E-07 | 7.9E-08 | 8.0E-08 | 1.7E-07 | 1.7E-07 | 1.5E-07 | 1.5E-07 | 1.8E-07 | 1.8E-07 | 8.6E-08 | 8.6E-08 |
| Tank Farm Q | 1.1E-06 | 7.5E-07 | 8.1E-07 | 5.5E-07 | 6.6E-07 | 4.5E-07 | 9.7E-07 | 6.6E-07 | 8.0E-07 | 5.4E-07 | 1.3E-06 | 8.8E-07 | 6.8E-07 | 4.6E-07 |
| Tank Farm G | 6.8E-08 | 6.8E-08 | 5.0E-08 | 5.0E-08 | 4.3E-08 | 4.3E-08 | 8.3E-08 | 8.3E-08 | 7.2E-08 | 7.2E-08 | 9.2E-08 | 9.2E-08 | 4.6E-08 | 4.6E-08 |
| Tank Farm D | 3.5E-08 | 7.0E-08 | 2.8E-08 | 5.6E-08 | 3.1E-08 | 6.1E-08 | 5.2E-08 | 1.0E-07 | 4.4E-08 | 8.7E-08 | 8.1E-08 | 1.6E-07 | 3.8E-08 | 7.5E-08 |
| Tank Farm E | 3.6E-09 | 3.6E-09 | 2.7E-09 | 2.7E-09 | 2.4E-09 | 2.4E-09 | 5.4E-09 | 5.4E-09 | 3.6E-09 | 3.6E-09 | 7.3E-09 | 7.3E-09 | 3.4E-09 | 3.4E-09 |
| Tank Farm F | 2.3E-11 | 3.3E-10 | 1.7E-11 | 2.5E-10 | 1.4E-11 | 2.1E-10 | 4.4E-11 | 6.4E-10 | 3.2E-11 | 4.6E-10 | 3.4E-11 | 4.9E-10 | 1.7E-11 | 2.5E-10 |
| Truck Washing | 8.4E-08 | 0 | 1.0E-07 | 0 | 2.1E-07 | 0 | 2.6E-08 | 0 | 1.4E-08 | 0 | 4.7E-08 | 0 | 8.7E-08 | 0 |
| Soil Gas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inorganic Waste Treatment System | -- | 8.5E-09 | -- | 9.3E-09 | -- | 1.1E-08 | -- | 2.7E-09 | -- | 2.4E-09 | -- | 8.0E-09 | -- | 1.3E-08 |
| **Total Risk** | **6.5E-06** | **5.1E-06** | **5.1E-06** | **4.0E-06** | **4.6E-06** | **3.4E-06** | **8.7E-06** | **6.9E-06** | **7.1E-06** | **5.6E-06** | **9.5E-06** | **7.2E-06** | **4.7E-06** | **3.6E-06** |

**Notes:**

[a] See Figure 3 for receptor locations

# FIGURES

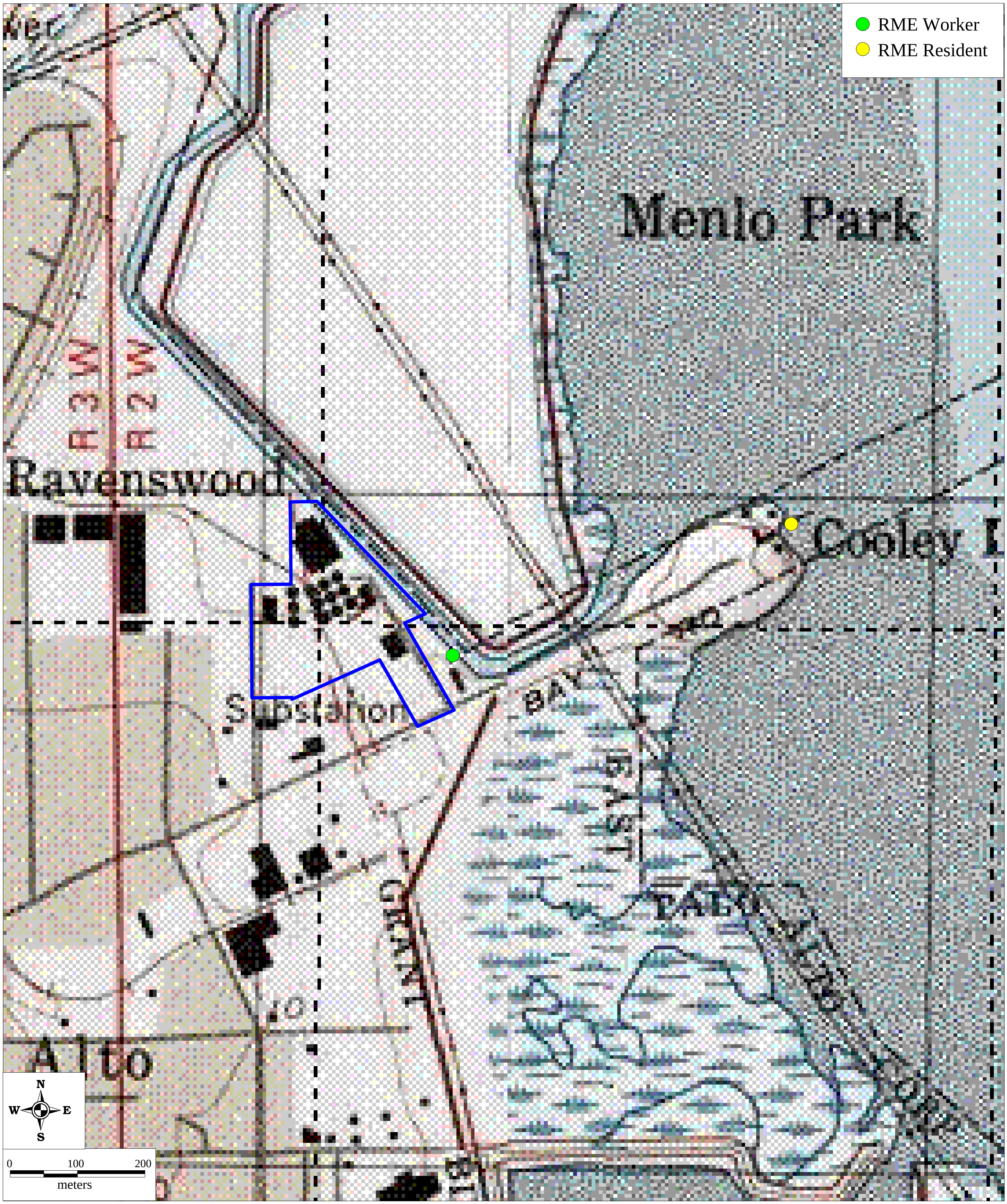
# Figure 1
# Revisions to HRA Sources
# Romic Facility
# East Palo Alto, California




U:\romic\gis\wrkspcs\Addendum sources.wor

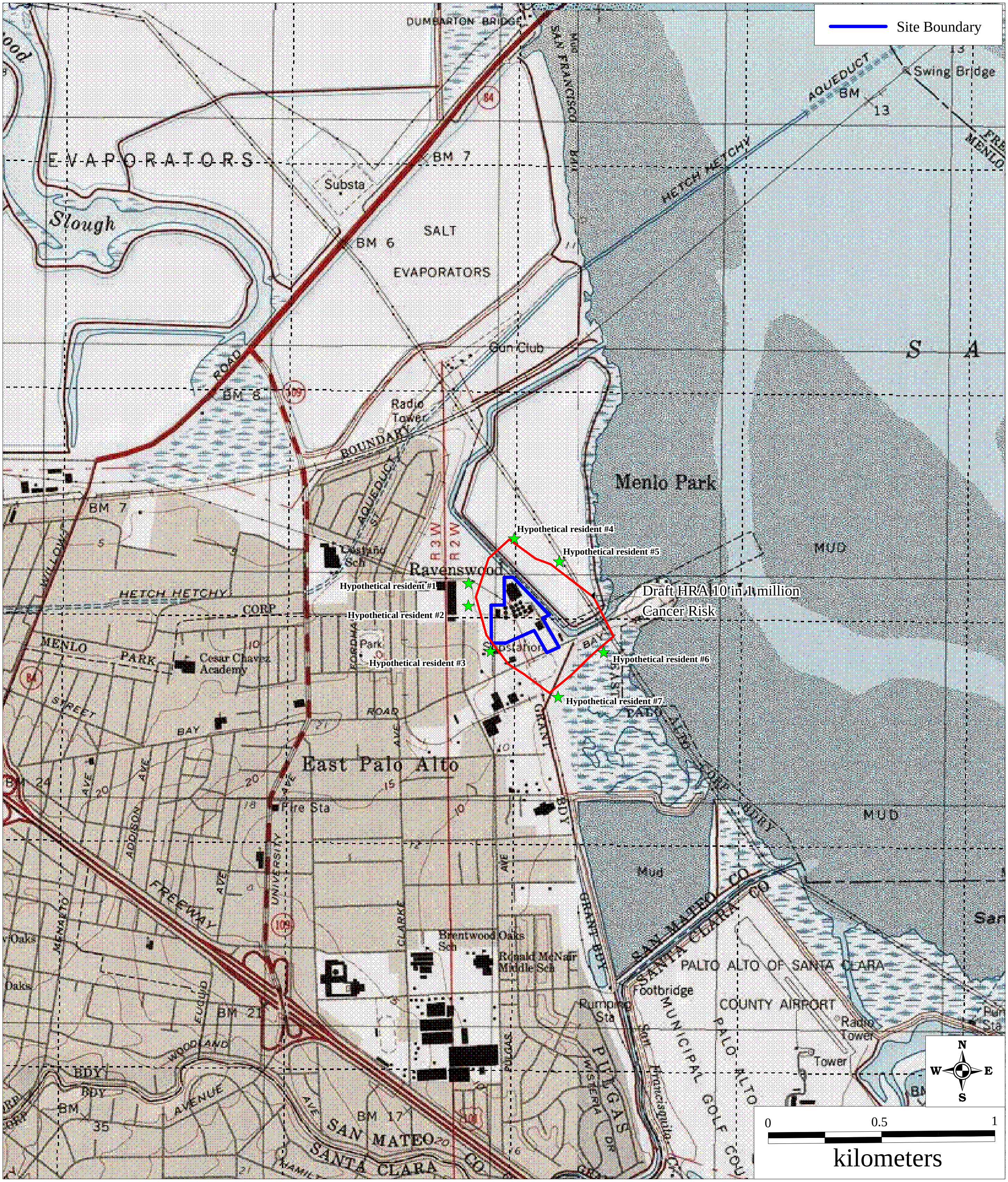
ENVIRON

**Figure 2**
**Location of Resident and Worker RME Cancer Risks in HRA**
**Romic Facility**
**East Palo Alto, California**




U:\romic\gis\wrkspcs\RME locations.wor

**Figure 3**
**Receptor Locations for Evaluation of 2001 HRA 1 x 10^-5 Residential Isopleth**
**Romic Facility**
**East Palo Alto, California**




U:\romic\gis\wrkspcs\Hypothetical resident receptor locations.wor

ENVIRON

# APPENDIX A

## ISC3 Input Files for Inorganic Waste Treatment System

```
**
****************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom94AR.INP
**
****************************************
**
**
****************************************
** ISCST3 Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1994 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Residential Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
```

```
   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
   DISCCART 576878.73 4147451.49
   DISCCART 577255.42 4147213.26
   DISCCART 577036.69 4147208.11
   DISCCART 576740.19 4148439.75
   DISCCART 576719.12 4148343.03
   DISCCART 576692.44 4148267.12
   DISCCART 576650.61 4148187.34
   DISCCART 576612.56 4148107.59
   DISCCART 576582.10 4148035.45
   DISCCART 576551.64 4147963.32
   DISCCART 576551.40 4147872.38
   DISCCART 576551.13 4147770.07
   DISCCART 576554.76 4147709.47
   DISCCART 576554.58 4147645.06
   DISCCART 576552.51 4147576.84
   DISCCART 576556.12 4147512.45
   DISCCART 576557.85 4147449.94
   DISCCART 576563.38 4147395.03
   DISCCART 576572.76 4147364.77
   DISCCART 576800.00 4147450.00
   DISCCART 577000.00 4147250.00
   DISCCART 577800.00 4147950.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL METDATA\CAR94300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1994
   UAIRDATA 6901 1994
   STARTEND 1994 1 1 1 1994 12 31 24
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
****************************************
**
**
```

```
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM94AR.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM94AR.IS\CONS.PLT
OU FINISHED
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```
**
****************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom95AR.INP
**
****************************************
**
**
****************************************
** ISCST3 Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1995 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Residential Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
```

```
   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
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   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
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   DISCCART 577255.42 4147213.26
   DISCCART 577036.69 4147208.11
   DISCCART 576740.19 4148439.75
   DISCCART 576719.12 4148343.03
   DISCCART 576692.44 4148267.12
   DISCCART 576650.61 4148187.34
   DISCCART 576612.56 4148107.59
   DISCCART 576582.10 4148035.45
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   DISCCART 576554.76 4147709.47
   DISCCART 576554.58 4147645.06
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   DISCCART 576556.12 4147512.45
   DISCCART 576557.85 4147449.94
   DISCCART 576563.38 4147395.03
   DISCCART 576572.76 4147364.77
   DISCCART 576800.00 4147450.00
   DISCCART 577000.00 4147250.00
   DISCCART 577800.00 4147950.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
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**
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   UAIRDATA 6901 1995
   STARTEND 1995 1 1 1 1995 12 31 24
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
****************************************
**
**
```

```
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM95AR.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM95AR.IS\CONS.PLT
OU FINISHED
```

```
**
****************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom96AR.INP
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****************************************
**
**
****************************************
** ISCST3 Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1996 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Residential Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
```

```
   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
   DISCCART 576878.73 4147451.49
   DISCCART 577255.42 4147213.26
   DISCCART 577036.69 4147208.11
   DISCCART 576740.19 4148439.75
   DISCCART 576719.12 4148343.03
   DISCCART 576692.44 4148267.12
   DISCCART 576650.61 4148187.34
   DISCCART 576612.56 4148107.59
   DISCCART 576582.10 4148035.45
   DISCCART 576551.64 4147963.32
   DISCCART 576551.40 4147872.38
   DISCCART 576551.13 4147770.07
   DISCCART 576554.76 4147709.47
   DISCCART 576554.58 4147645.06
   DISCCART 576552.51 4147576.84
   DISCCART 576556.12 4147512.45
   DISCCART 576557.85 4147449.94
   DISCCART 576563.38 4147395.03
   DISCCART 576572.76 4147364.77
   DISCCART 576800.00 4147450.00
   DISCCART 577000.00 4147250.00
   DISCCART 577800.00 4147950.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL METDATA\CAR96300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1996
   UAIRDATA 6901 1996
   STARTEND 1996 1 1 1 1996 12 31 24
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
****************************************
**
**
```

```
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM96AR.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM96AR.IS\CONS.PLT
OU FINISHED
```

```
**
****************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom97AR.INP
**
****************************************
**
**
****************************************
** ISCST3 Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1997 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Residential Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
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****************************************
** ISCST3 Receptor Pathway
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**
**
RE STARTING
   DISCCART 576878.73 4147451.49
   DISCCART 577255.42 4147213.26
   DISCCART 577036.69 4147208.11
   DISCCART 576740.19 4148439.75
   DISCCART 576719.12 4148343.03
   DISCCART 576692.44 4148267.12
   DISCCART 576650.61 4148187.34
   DISCCART 576612.56 4148107.59
   DISCCART 576582.10 4148035.45
   DISCCART 576551.64 4147963.32
   DISCCART 576551.40 4147872.38
   DISCCART 576551.13 4147770.07
   DISCCART 576554.76 4147709.47
   DISCCART 576554.58 4147645.06
   DISCCART 576552.51 4147576.84
   DISCCART 576556.12 4147512.45
   DISCCART 576557.85 4147449.94
   DISCCART 576563.38 4147395.03
   DISCCART 576572.76 4147364.77
   DISCCART 576800.00 4147450.00
   DISCCART 577000.00 4147250.00
   DISCCART 577800.00 4147950.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL METDATA\CAR97300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1997
   UAIRDATA 6901 1997
   STARTEND 1997 1 1 1 1997 12 31 24
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
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OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM97AR.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM97AR.IS\CONS.PLT
OU FINISHED
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**
***************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom98AR.INP
**
***************************************
**
**
***************************************
** ISCST3 Control Pathway
***************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1998 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Residential Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
***************************************
** ISCST3 Source Pathway
***************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 1.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 1.00 0.50
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
   DISCCART 576878.73 4147451.49
   DISCCART 577255.42 4147213.26
   DISCCART 577036.69 4147208.11
   DISCCART 576740.19 4148439.75
   DISCCART 576719.12 4148343.03
   DISCCART 576692.44 4148267.12
   DISCCART 576650.61 4148187.34
   DISCCART 576612.56 4148107.59
   DISCCART 576582.10 4148035.45
   DISCCART 576551.64 4147963.32
   DISCCART 576551.40 4147872.38
   DISCCART 576551.13 4147770.07
   DISCCART 576554.76 4147709.47
   DISCCART 576554.58 4147645.06
   DISCCART 576552.51 4147576.84
   DISCCART 576556.12 4147512.45
   DISCCART 576557.85 4147449.94
   DISCCART 576563.38 4147395.03
   DISCCART 576572.76 4147364.77
   DISCCART 576800.00 4147450.00
   DISCCART 577000.00 4147250.00
   DISCCART 577800.00 4147950.00
RE FINISHED
**
****************************************
** ISCST3 Meteorology Pathway
****************************************
**
**
ME STARTING
   INPUTFIL METDATA\CAR98300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1998
   UAIRDATA 6901 1998
   STARTEND 1998 1 1 1 1998 12 31 24
ME FINISHED
**
****************************************
** ISCST3 Output Pathway
****************************************
**
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OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM98AR.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM98AR.IS\CONS.PLT
OU FINISHED
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**
****************************************
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom94AWb.INP
**
****************************************
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****************************************
** ISCST3 Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1994 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Worker B Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
****************************************
** ISCST3 Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.92 7.92 7.92
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
**
****************************************
** ISCST3 Receptor Pathway
****************************************
**
**
RE STARTING
   DISCCART 576200.00 4146850.00
   DISCCART 576300.00 4146850.00
   DISCCART 576400.00 4146850.00
   DISCCART 576500.00 4146850.00
   DISCCART 576600.00 4146850.00
   DISCCART 576700.00 4146850.00
   DISCCART 576800.00 4146850.00
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   DISCCART 577300.00 4146850.00
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DISCCART 577300.00 4147950.00
DISCCART 577400.00 4147950.00
DISCCART 577500.00 4147950.00
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   DISCCART 577057.14 4147975.91
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** ISCST3 Meteorology Pathway
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ME STARTING
   INPUTFIL METDATA\CAR94300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1994
   UAIRDATA 6901 1994
   STARTEND 1994 1 1 1 1994 12 31 24
ME FINISHED
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** ISCST3 Output Pathway
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**
**
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM94AWB.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM94AWB.IS\CONS.PLT
OU FINISHED
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**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom95AWb.INP
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** ISCST3 Control Pathway
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**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1995 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Worker B Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
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** ISCST3 Source Pathway
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**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
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   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
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** ISCST3 Receptor Pathway
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** ISCST3 Meteorology Pathway
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   UAIRDATA 6901 1995
   STARTEND 1995 1 1 1 1995 12 31 24
ME FINISHED
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** ISCST3 Output Pathway
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OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM95AWB.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM95AWB.IS\CONS.PLT
OU FINISHED
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** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom96AWb.INP
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** ISCST3 Control Pathway
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CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1996 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Worker B Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
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** ISCST3 Source Pathway
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SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
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   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
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   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
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** ISCST3 Receptor Pathway
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   DISCCART 577057.14 4147975.91
RE FINISHED
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** ISCST3 Meteorology Pathway
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ME STARTING
   INPUTFIL METDATA\CAR96300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1996
   UAIRDATA 6901 1996
   STARTEND 1996 1 1 1 1996 12 31 24
ME FINISHED
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** ISCST3 Output Pathway
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**
**
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM96AWB.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM96AWB.IS\CONS.PLT
OU FINISHED
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** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom97AWb.INP
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** ISCST3 Control Pathway
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**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1997 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Worker B Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
**
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** ISCST3 Source Pathway
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**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
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   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
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** ISCST3 Receptor Pathway
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RE STARTING
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RE FINISHED
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** ISCST3 Meteorology Pathway
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ME STARTING
   INPUTFIL METDATA\CAR97300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1997
   UAIRDATA 6901 1997
   STARTEND 1997 1 1 1 1997 12 31 24
ME FINISHED
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** ISCST3 Output Pathway
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**
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM97AWB.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM97AWB.IS\CONS.PLT
OU FINISHED
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** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 4.5
** Lakes Environmental Software Inc.
** Date: 6/26/2003
** File: C:\Lakes\Romic\Rom98AWb.INP
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** ISCST3 Control Pathway
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**
CO STARTING
   TITLEONE ROMIC:  X/Q Model Run with 1998 San Carlos Meteorological Data
   TITLETWO One-Hour, 24-Hour, and Annual Worker B Averages
   MODELOPT DFAULT CONC  RURAL
   AVERTIME 1 24 ANNUAL
   POLLUTID OTHER
   TERRHGTS FLAT
   RUNORNOT RUN
CO FINISHED
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** ISCST3 Source Pathway
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**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CONS POINT 577090.250 4147952.860
   LOCATION IWPB POINT 577090.000 4147864.200
** Source Parameters **
   SRCPARAM CONS 0.01 3.660 0.000 18.03000 0.400
   SRCPARAM IWPB 0.01 9.140 0.000 14.37000 0.460
** Building Downwash **
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT CONS 7.62 7.62 7.62 7.62 7.62 7.62
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   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDHGT IWPB 7.62 7.62 7.62 7.62 7.62 7.62
   BUILDWID CONS 42.19 39.75 36.13 31.25 25.50 19.25
   BUILDWID CONS 19.00 26.75 33.75 39.75 44.25 47.50
   BUILDWID CONS 49.50 49.75 48.50 47.25 45.88 43.38
   BUILDWID CONS 42.20 39.75 36.13 31.25 25.50 19.00
   BUILDWID CONS 19.25 26.75 33.75 39.75 44.25 47.75
   BUILDWID CONS 49.50 50.00 48.75 47.13 45.88 43.38
   BUILDWID IWPB 37.13 34.81 31.38 27.25 22.00 16.25
   BUILDWID IWPB 15.50 21.50 26.75 31.25 34.50 37.25
   BUILDWID IWPB 38.50 38.50 37.75 37.25 38.38 38.31
   BUILDWID IWPB 37.13 34.81 31.38 20.25 19.50 18.00
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   BUILDWID IWPB 15.75 21.50 26.75 31.25 34.75 37.00
   BUILDWID IWPB 38.25 38.75 37.50 37.13 38.38 38.31
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT CONS HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT CONS HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 1.00 1.00 1.00 1.00
   EMISFACT IWPB HROFDY 0.50 1.00 1.00 1.00 0.00 0.00
   EMISFACT IWPB HROFDY 0.00 0.00 0.00 0.00 0.00 0.00
   SRCGROUP CONS CONS
   SRCGROUP IWPB IWPB
   SRCGROUP ALL
SO FINISHED
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** ISCST3 Receptor Pathway
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RE STARTING
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   DISCCART 577058.12 4147921.97
   DISCCART 577057.69 4147945.41
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   DISCCART 577057.14 4147975.91
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** ISCST3 Meteorology Pathway
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   INPUTFIL METDATA\CAR98300.ASC
   ANEMHGHT 14.7 METERS
   SURFDATA 6901 1998
   UAIRDATA 6901 1998
   STARTEND 1998 1 1 1 1998 12 31 24
ME FINISHED
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** ISCST3 Output Pathway
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**
OU STARTING
   RECTABLE ALLAVE FIRST
   RECTABLE 1 FIRST
   RECTABLE 24 FIRST
   PLOTFILE ANNUAL IWPB ROM98AWB.IS\IWPB.PLT
   PLOTFILE ANNUAL CONS ROM98AWB.IS\CONS.PLT
OU FINISHED
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# APPENDIX B

## SCREEN 3 Results for Solids Consolidation

06/17/03
13:40:41

***  SCREEN3 MODEL RUN  ***
*** VERSION DATED 96043 ***

Solids Consolidation Volume Source (Draft HRA)

SIMPLE TERRAIN INPUTS:

| | | |
|---|---|---|
| SOURCE TYPE | = | VOLUME |
| EMISSION RATE (G/S) | = | 1.00000 |
| SOURCE HEIGHT (M) | = | 3.8100 |
| INIT. LATERAL DIMEN (M) | = | 6.0400 |
| INIT. VERTICAL DIMEN (M) | = | 3.5442 |
| RECEPTOR HEIGHT (M) | = | .0000 |
| URBAN/RURAL OPTION | = | RURAL |

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 10. | .0000 | 0 | .0 | .0 | .0 | .00 | .00 | .00 | |
| 100. | 4908. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 9.60 | 5.13 | NO |
| 200. | 3136. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 13.05 | 6.58 | NO |
| 300. | 2175. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 16.41 | 7.95 | NO |
| 400. | 1603. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 19.70 | 9.26 | NO |
| 500. | 1235. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 22.95 | 10.52 | NO |
| 600. | 1018. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 26.14 | 11.30 | NO |
| 700. | 839.7 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 29.30 | 12.33 | NO |
| 800. | 707.1 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 32.43 | 13.33 | NO |
| 900. | 613.6 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 35.52 | 14.08 | NO |
| 1000. | 534.5 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 38.58 | 14.94 | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND    10. M:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14. | 7748. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 6.58 | 3.80 | NO |

DWASH=   MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

********************************
*** SCREEN DISCRETE DISTANCES ***
********************************

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 20. | 7496. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 6.76 | 3.89 | NO |
| 30. | 7093. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 7.12 | 4.05 | NO |
| 40. | 6719. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 7.48 | 4.20 | NO |
| 50. | 6364. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 7.83 | 4.35 | NO |
| 60. | 6032. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 8.19 | 4.51 | NO |
| 70. | 5721. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 8.54 | 4.67 | NO |
| 80. | 5431. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 8.90 | 4.82 | NO |
| 90. | 5161. | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 9.25 | 4.97 | NO |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

***************************************
*** SUMMARY OF SCREEN MODEL RESULTS ***
***************************************

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
|---|---|---|---|
| SIMPLE TERRAIN | 7748. | 14. | 0. |

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************

06/17/03
13:37:56

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Solids Consolidation Point Source (HRA Addendum)

SIMPLE TERRAIN INPUTS:

```
   SOURCE TYPE            =        POINT
   EMISSION RATE (G/S)    =      1.00000
   STACK HEIGHT (M)       =       3.6600
   STK INSIDE DIAM (M)    =        .4000
   STK EXIT VELOCITY (M/S)=      18.0271
   STK GAS EXIT TEMP (K)  =     293.0000
   AMBIENT AIR TEMP (K)   =     293.0000
   RECEPTOR HEIGHT (M)    =        .0000
   URBAN/RURAL OPTION     =        RURAL
   BUILDING HEIGHT (M)    =       2.5900
   MIN HORIZ BLDG DIM (M) =       6.2000
   MAX HORIZ BLDG DIM (M) =      13.3000
```

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 4800.0000 (ACFM)

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = 12.999 M**4/S**2.

*** FULL METEOROLOGY ***

```
**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************
```

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 10. | 259.4 | 4 | 20.0 | 20.0 | 6400.0 | 3.68 | .96 | 1.32 | SS |
| 100. | 624.4 | 4 | 8.0 | 8.0 | 2560.0 | 4.71 | 8.20 | 4.65 | SS |
| 200. | 474.6 | 5 | 5.0 | 5.0 | 10000.0 | 6.92 | 11.63 | 6.24 | SS |
| 300. | 491.6 | 5 | 1.0 | 1.0 | 10000.0 | 15.58 | 17.23 | 9.34 | NO |
| 400. | 490.0 | 5 | 1.0 | 1.0 | 10000.0 | 15.58 | 22.27 | 11.34 | NO |
| 500. | 523.0 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 18.23 | 8.95 | NO |
| 600. | 526.1 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 21.46 | 10.17 | NO |
| 700. | 502.1 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 24.65 | 11.36 | NO |
| 800. | 464.5 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 27.81 | 12.37 | NO |
| 900. | 426.6 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 30.93 | 13.35 | NO |
| 1000. | 390.6 | 6 | 1.0 | 1.0 | 10000.0 | 14.52 | 34.03 | 14.29 | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 53. | 840.4 | 4 | 10.0 | 10.0 | 3200.0 | 4.19 | 4.63 | 2.91 | SS |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED

DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*********************************
*** SCREEN DISCRETE DISTANCES ***
*********************************

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 20. | 554.5 | 4 | 20.0 | 20.0 | 6400.0 | 3.70 | 1.84 | 1.77 | SS |
| 30. | 762.2 | 4 | 15.0 | 15.0 | 4800.0 | 3.79 | 2.68 | 2.13 | SS |
| 40. | 796.4 | 4 | 15.0 | 15.0 | 4800.0 | 3.79 | 3.50 | 2.58 | SS |
| 50. | 837.5 | 4 | 10.0 | 10.0 | 3200.0 | 4.19 | 4.31 | 2.74 | SS |
| 60. | 822.0 | 4 | 10.0 | 10.0 | 3200.0 | 4.19 | 5.11 | 3.17 | SS |
| 70. | 762.6 | 4 | 10.0 | 10.0 | 3200.0 | 4.19 | 5.89 | 3.60 | SS |
| 80. | 731.0 | 4 | 8.0 | 8.0 | 2560.0 | 4.71 | 6.67 | 3.83 | SS |
| 90. | 680.5 | 4 | 8.0 | 8.0 | 2560.0 | 4.71 | 7.44 | 4.24 | SS |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****************************************
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****************************************

| *** CAVITY CALCULATION - 1 *** | | *** CAVITY CALCULATION - 2 *** | |
|---|---|---|---|
| CONC (UG/M**3) = | .0000 | CONC (UG/M**3) = | .0000 |
| CRIT WS @10M (M/S) = | 99.99 | CRIT WS @10M (M/S) = | 99.99 |
| CRIT WS @ HS (M/S) = | 99.99 | CRIT WS @ HS (M/S) = | 99.99 |
| DILUTION WS (M/S) = | 99.99 | DILUTION WS (M/S) = | 99.99 |
| CAVITY HT (M) = | 2.77 | CAVITY HT (M) = | 2.59 |
| CAVITY LENGTH (M) = | 10.19 | CAVITY LENGTH (M) = | 6.79 |
| ALONGWIND DIM (M) = | 6.20 | ALONGWIND DIM (M) = | 13.30 |

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****************************************
END OF CAVITY CALCULATIONS
****************************************

***************************************
*** SUMMARY OF SCREEN MODEL RESULTS ***
***************************************

CALCULATION MAX CONC DIST TO TERRAIN

```
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   -------   -------
SIMPLE TERRAIN      840.4           53.        0.

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************
```

# APPENDIX C

## SCREEN3 Results for Aerosol Can Depressurization

06/27/03
14:39:45

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Aerosol can depressurization - North building

SIMPLE TERRAIN INPUTS:

| | | |
|---|---|---|
| SOURCE TYPE | = | VOLUME |
| EMISSION RATE (G/S) | = | .490000E-01 |
| SOURCE HEIGHT (M) | = | 3.8100 |
| INIT. LATERAL DIMEN (M) | = | 6.0400 |
| INIT. VERTICAL DIMEN (M) | = | 3.5442 |
| RECEPTOR HEIGHT (M) | = | .0000 |
| URBAN/RURAL OPTION | = | RURAL |

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 28. | 351.4 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 7.05 | 4.02 | NO |
| 100. | 240.5 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 9.60 | 5.13 | NO |
| 200. | 153.7 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 13.05 | 6.58 | NO |
| 300. | 106.6 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 16.41 | 7.95 | NO |
| 400. | 78.56 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 19.70 | 9.26 | NO |
| 500. | 60.52 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 22.95 | 10.52 | NO |
| 600. | 49.87 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 26.14 | 11.30 | NO |
| 700. | 41.15 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 29.30 | 12.33 | NO |
| 800. | 34.65 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 32.43 | 13.33 | NO |
| 900. | 30.07 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 35.52 | 14.08 | NO |
| 1000. | 26.19 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 38.58 | 14.94 | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 28. M:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 28. | 351.4 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 7.05 | 4.02 | NO |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

***************************************
*** SUMMARY OF SCREEN MODEL RESULTS ***
***************************************

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
| --- | --- | --- | --- |
| SIMPLE TERRAIN | 351.4 | 28. | 0. |

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************

06/27/03
14:40:44

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Aerosol can depressurization - South building

SIMPLE TERRAIN INPUTS:

| | | |
|---|---|---|
| SOURCE TYPE | = | VOLUME |
| EMISSION RATE (G/S) | = | .160000E-01 |
| SOURCE HEIGHT (M) | = | 3.8100 |
| INIT. LATERAL DIMEN (M) | = | 8.3900 |
| INIT. VERTICAL DIMEN (M) | = | 3.5442 |
| RECEPTOR HEIGHT (M) | = | .0000 |
| URBAN/RURAL OPTION | = | RURAL |

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 36. | 83.41 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 9.66 | 4.13 | NO |
| 100. | 63.47 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 11.88 | 5.13 | NO |
| 200. | 42.88 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 15.26 | 6.58 | NO |
| 300. | 30.73 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 18.58 | 7.95 | NO |
| 400. | 23.14 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 21.84 | 9.26 | NO |
| 500. | 18.10 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 25.05 | 10.52 | NO |
| 600. | 15.08 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 28.22 | 11.30 | NO |
| 700. | 12.55 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 31.36 | 12.33 | NO |
| 800. | 10.65 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 34.46 | 13.33 | NO |
| 900. | 9.290 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 37.54 | 14.08 | NO |
| 1000. | 8.130 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 40.58 | 14.94 | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 36. M:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 36. | 83.41 | 6 | 1.0 | 1.0 | 10000.0 | 3.81 | 9.66 | 4.13 | NO |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

***************************************
*** SUMMARY OF SCREEN MODEL RESULTS ***
***************************************

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
|---|---|---|---|
| SIMPLE TERRAIN | 83.41 | 36. | 0. |

```
***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************
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# APPENDIX D
## Updated Response to DTSC Comments on 2001 HRA Report

HRA/ERA COMMENT RESPONSE

| DTSC COMMENT | ROMIC RESPONSE |
|---|---|
| SECTION 2: SITE DESCRIPTION<br>1. A number of statements in Section 2 (Site Description) are inconsistent or potentially inconsistent with the Part B application. Examples include, but may not be limited to, the following; | |
| ♦ "The Site is approximately 14 acres" (page 2-1). Part B mentions that the waste management area is about 2 acres. | The property owned by Romic and considered the facility proper is approximately fourteen acres. The waste management activities (e.g., container storage, tank storage, waste treatment) are concentrated on about two acres within the fourteen, as noted in the revised Part B application. These two acres are what the 2001 HRA refers to in the next sentence ("…the Site has a central processing area…"). |
| ♦ "The Site primarily recycles…" (page 2-1). "These…wastes make up approximately 95% of the waste recycled and processed at the Site…. The other five percent…"(page 2-2). All waste stated here appear to be liquid based. Part B, however, suggests that both liquid and solid based wastes are being handles at Romic in significant quantities. | The facility accepts liquid wastes as well as contaminated solid wastes. Liquids are processed at the facility using either refinement processes such as distillation or blended to produce a useful fuel and/or biological treatment. Some liquid waste is not processed on-site, but rather shipped off-site to the appropriate facility.<br><br>Solids are also accepted at the facility for either processing in the consolidation area, or in the labpack area. Solids handled in the consolidation area are typically materials contaminated with liquids, such as rags or paper products. Some consolidation of lab pack quantities of solids may occur; these quantities would be limited (annual average < 20 pounds per day, any given day < 500 pounds).<br><br>Solids are also processed in the debris shredder. Emissions from the debris shredder are controlled using the Liquefaction VOC control system. The planned inorganic treatment system may handle precipitated solids generated from processing wastewater. |
| ♦ "The Site proposes to install a metals recovery system for reclaiming trace metals in wastewater" (page 2-2). This is not discussed in Part B. | The metals recovery system was included in earlier versions of the Part B application. The current version of the Part B application includes an inorganic treatment system. This system has been further evaluated in the HRA Addendum. |
| ♦ "No changes to the size of the facility" (page 2-3). Part B proposes at least 16 additional tanks and more than 20 additional process units. | The additional tanks and process units described in the Part B will be constructed within the boundaries of the existing facility. |
| ♦ The planned modifications as listed on page 2-3 are not entirely consistent with what are described in Part B. Neutralization, for instance, is not included here. | The planned modifications include the following:<br>• Change the designation of existing, but previously unregulated, storage tanks and units to a designation of regulated under the permit<br>• Add tanks for organic liquid and wastewater<br>• Add tanks for fuel-blending operations<br>• Add (inorganic) wastewater treatment units, including |

| DTSC COMMENT | ROMIC RESPONSE |
|---|---|
| | neutralization and chemical precipitation<br>• Designate the drum sampling area as a container storage area<br>• Add other miscellaneous treatment units |
| In addition, Section 2 lacks a description of processes involving wastes received on site in solid forms and the emission potentials associated with them. Please revise Section 2 for better consistency and clarity. | The majority of the emissions from this site come from processing liquid solvents or wastewater containing volatile organic compounds.<br><br>There are a small percentage of emissions from solids that have volatile material on them (e.g., rags soaked with solvent). These emissions occur in the consolidation area and are accounted for in the 2001 HRA.<br><br>Emissions could result from handling solids contaminated with volatile materials or from shredding solid material contaminated with volatile material. These emissions have also been considered in the 2001 HRA.<br><br>The only other source that processes solids at the facility is the Labpack Processing Area. The solids processed here are typically contaminated materials such as thermometers, or broken contaminated laboratory materials, such as glass vessels. Volatile emissions could result from handling solid material contaminated with volatile substances. These emissions are captured by the labpack scrubber and controlled. These emissions have also been included in the 2001 HRA. There is no potential for emissions of particulates from these two sources.<br><br>The facility has proposed an inorganic treatment system. This process would include the stabilization of waste with cement kiln dust and lime. A baghouse has been proposed to mitigate the fugitive emissions of cement kiln dust and lime within the enclosed process area. This system has been further evaluated in the HRA Addendum. |
| SECTION 3: HAZARD IDENTIFICATION<br><br>1. The 82 chemicals selected for risk evaluation are based on a master list of 248 chemicals compiled from the manifest data of 1997 to 1998. Since Romic's waste streams vary from time to time, it is unclear how much the master list compiled from the 1997-1998 data reflects the wastes Romic processes at the present time and/or in the future. Methanesulfonic acid, for example, is shown to be present at concentrations as high as 50% in some of the wastes currently accepted for treatment at Romic (see Part B, Appendix C-1). It is, however, not identified as one of the 248 chemicals in the master list.<br><br>Please ensure that the chemicals selected for risk | Guidance from DTSC (1996, 1997) recommends the use of relevant manifest data to characterize emissions. This is generally interpreted as at least one year of recent manifest data. Romic personnel conducted a review of the most recent year of manifest data available at the time of the 2001 HRA (1997-1998). This information, along with marketing (i.e., future expectations) and stack test data, was used to develop the master list of chemicals received at the site.<br><br>It is correct that the original Part B included a sample manifest that included methanesulfonic acid. However, further review of the TRI raw data does not show this chemical as being managed at the facility in any appreciable quantity. |

| DTSC COMMENT | ROMIC RESPONSE |
| --- | --- |
| evaluation do adequately represent the risks associated with the operation as described in the Part B application. Both the current and the future operation should be considered. | |
| 2. Based on the chemical selection list dated December 10, 1999, a total of 57 chemicals are identified for quantitative health risk evaluation for routine operations. However, only 40 chemicals are included in the HRA Report (see Appendix A, Table 8) in which 39 are calculated for cancer or noncancer health effects. Please explain the discrepancies. | This is a difference of 17 chemicals as follows:<br>1) As discussed on page A-6 paragraph 5, 1,2-dibromo-3-chloropropane was originally listed in the manifests with a concentration of zero and was removed from the list. Ethylene glycol methyl ether and trichlorofluoromethane are no longer received at the site.<br>2) As discussed on Page A-6 paragraph 6, many of the constituents from drum liquefaction, based on diesel fuel composition, did not have chronic or acute toxicity values or exceed the odor threshold. These chemicals were not quantitatively evaluated. The list includes the following nine chemicals: ethane, isobutane, methane, n-butane, n-decane, n-nonane, n-octane, n-pentane, and propane.<br>3) As discussed on Page A-2 paragraph 1, "In the initial chemical selection process, chemical constituents from the organic wastewater stream were selected based on a wastewater stream grab sample. However, according to facility personnel, the aqueous organic waste stream is 5% material with the same composition as the liquid organic waste stream and 95% water. In order to be consistent, the chemical constituents of emissions from the organic wastewater were assumed to be equivalent to those in the liquid organic waste stream." This revision applies to the following five chemicals: 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; 1,4-difluorobenzene; and ethyl benzene. With the exception of 1,4-difluorobenzene (which was not reported on the manifests received at the site), all of these chemicals were evaluated in the screening selection of chemicals and were not selected for further quantitative evaluation (see Appendix A). |
| 3. To improve the overall clarity, please state preferably in page 3-2, that a total of 39 chemicals (columns 1 and 2) are quantified for health risk impacts, 29 chemicals (column 3) are selected for potential acute health effects associated with non-routine releases, and 35 chemicals (column 4) are evaluated for odor impacts. | This clarification is correct. |
| 4. The HRA identifies a boiler used as part of an air pollution control device at Romic. Please address the potential for the boiler to emit dioxins and/or other incomplete combustion products. Detailed information on the boiler such as operating temperature and verification/certification that it meets RCRA air requirements for process vents is required. Please refer to Section 5, Comment #1 for further details. | In order to reduce the potential for dioxin formation in and emission from the boilers, Romic has modified its operating procedures. When chlorinated organic compounds are being distilled, process vent vapors are controlled using activated carbon beds instead of the boilers. This is described in Section E of the revised Part B application.<br><br>Information on Subpart AA requirements is included in the revised Part B application, in Section M. |

| DTSC COMMENT | ROMIC RESPONSE |
|---|---|
| | |
| 5. A number of statements in Appendix A of Section 3 (Hazard Identification) are inconsistent or potentially inconsistent with the Part B application. Examples include, but may not be limited to, the following:<br><br>♦ "The main operations at the Site consist of solvent recycling, fuel blending and biological wastewater treatment" (page A-1). Other management practices mentioned in Part B, such as neutralization and miscellaneous materials management, are also major operations; therefore should be included in the discussion. | The main operations at the Site do indeed consist of solvent recycling, fuel blending, and biological wastewater treatment. Other processes may be major operations, but they represent lower proportions of the waste managed by the facility, and/or represent less contribution to health risk. |
| ♦ "According to facility personnel, the aqueous organic waste stream is 5% organic material with the same composition as the liquid organic waste stream and 95% water" (page A-2, paragraph 1). This is not mentioned in the Part B. | This is an assumption used for modeling purposes in the 2001 HRA. This assumption is based on an approximated waste characterization of aqueous wastes over a period of time. Aqueous organic waste streams will vary in composition, but the time- and flow-averaged composition can be assumed in this manner. |
| ♦ "…the facility occasionally uses liquid waste materials to rinse the trucks" (page A-2, paragraph 1). This is not mentioned in Part B. | Romic does not use liquid waste materials to rinse trucks. Emissions from this source were removed in the HRA Addendum. |
| ♦ "The lab pack…contributes less than 0.5% of the total volatile emissions…"(page A-2, paragraph 2). This is not mentioned in Part B. | The contribution of the lab pack to total volatile emissions at this facility is a value estimated in the 2001 HRA and further described in Section 5.0 and Appendix C of the 2001 HRA. This estimation was not performed as part of the Part B permit application and, therefore, is not discussed in the Part B permit. |
| ♦ "Chemical constituents from emissions from drum liquefaction operations are based solely on the composition of diesel fuel used in the process" (page A-2, paragraph 3). According to Part B, diesel fuel is used to suspend the sludges. Please explain why organic constituents contained in the sludges need not be considered in the emission estimates. | The 2001 HRA evaluated both controlled emissions from the scrubber system and fugitive emissions from cleaning the drums and handling wet clean drums. The emissions were characterized as diesel vapors. In fact, the majority of the vapor emissions from this operation are likely to be solvent vapor. Solvent is used at a rate of approximately 700 gallons per day. Diesel is used at a rate of approximately 45 to 50 gallons per day. Furthermore, the solvent is much more volatile than diesel and, therefore, any emissions from the use of both these materials is likely to be dominated by the constituents of the solvent.<br><br>In the HRA Addendum, the speciation of the emissions from the scrubber system was revised to be characterized as organic solvent vapors. This reflects the greater usage of solvent and the greater volatility of the components in the solvent. The 2001 HRA also assumed that the fugitive emissions from this source were diesel vapors. These fugitive emissions would |

| DTSC COMMENT | ROMIC RESPONSE |
|---|---|
| | likely result from some evaporation of diesel wetting the inside of clean, empty drums. In the HRA Addendum, it was assumed that there would be up to a 1% loss due to evaporation. |
| ♦ …diphenyl oxide (page A-4, paragraph 3), ethylene glycol methyl ether and trichlorofluoromethane (page A-6, last paragraph),Hydrogen cyanide (page A-7, paragraph 3)…are no longer received at the Site. This is not mentioned in Part B. | Diphenyl oxide, ethylene glycol methyl ether, and trichlorofluoromethane are not received at the facility because of market conditions not because of facility intent. The facility desires to retain the ability to accept these materials in the Part B. Hydrogen cyanide is identified by EPA waste number P063, a code not listed in the submitted Part A or the Part B. |
| In addition, Appendix A lacks a discussion of miscellaneous wastes received on site in solid forms and their emission potentials. Please revise this section for better consistency and clarity. | See previous discussion of units at the facility processing solids. |
| 6. Some errors or potential errors including, but may not limited to, the following are noted in Appendix A:<br><br>♦ Sixty-five chemicals…were also eliminated for further evaluation (page A-5, paragraph 5). It should be 74 instead. | The statement is correct as stands. Nine chemicals had no vapor pressure values available and 65 chemicals had a vapor pressure below $10^{-3}$ mm Hg. A total of 74 chemicals were removed at this step. |
| ♦ Page A-6, last paragraph, it appears that the correct statement should be "Although *1,2-dibromo-3-chloropropane and ethylene glycol methyl ether were listed on the manifests, the listed concentrations were zero and these chemicals were removed from the assessment. Another chemical, trichlorofluoromethane, is no longer received at the Site.*" Please confirm. | This is correct. |
| SECTION 4: IDENTIFICATION OF POTENTIAL HUMAN EXPOSURE PATHWAYS AND EXPOSED POPULATIONS<br><br>1. Please refer to Attachments I and II for comments on exposure pathways and populations exposed. | See attachments (below) for responses to specific comments. |
| SECTION 5: ESTIMATION OF REPRESENTATIVE EXPOSURE CONCENTRATIONS<br><br>1. Emission estimates as shown in this Chapter can not be reviewed or independently verified due to a lack of basic technical information that describes | The revised Part B application provides this information. |

| DTSC COMMENT | ROMIC RESPONSE |
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| each process unit, waste types, waste throughput, and the associated control equipment and their efficiencies. Please provide the required information in the Part B or HRA for the review. | |
| 2. Inconsistency between the HRA and Part B has been noted in a number of areas including the identification of potential emission sources, the wastes handled and the processes intended. Attachment III provides a list of the discrepancies noted. Please review to ensure all Information provided in the HRA is consistent with what is being presented in the Part B. | See Attachment III for responses to specific comments. |
| 3. Please refer to Attachment I for review comments on the air dispersion modeling. | See Attachment I for responses to specific comments. |
| SECTION 6: RISK CHARACTERIZATION<br><br>1. Please refer to Attachment II for review comments on risk characterization. | <br><br>See Attachment II for responses to specific comments. |
| SECTION 7: EVALUATION OF NON-ROUTINE RELEASES<br><br>1. The HRA selects methanol and 1,1,1-TCA both in 100% pure product form, in the evaluation of accidental spill. Given that Romic's waste streams vary from time to time, it is likely that the products Romic generates would also change from time to time. Please ensure that methanol and 1,1,1-TCA The HRA selects methanol and 1,1,1-TCA, both in 100% pure adequately represent the risk resulted from an accidental release based on Romic's current and future operation. | <br><br>A ranking procedure that endeavored to weigh several factors that would affect the potential impact of an accidental release of a substance, including quantity, vapor pressure and relative acute toxicity was used.<br><br>A ratio was calculated for each chemical, whether it was in pure form or as a component of a mixture. The ratio calculated was the product of vapor pressure and quantity divided by the ERPG-3. For example, for Scenario #1, methanol was selected. While it is not the most toxic substance, the typical quantity transported and its vapor pressure combined make it the most likely to have an adverse impact should an accidental release occur. |
| 2. At this time, DTSC has not requested the Air Resource Board (ARB) to review the adequacy of air modeling for accidental spills as Romic is still revising its Part B. When Romic completes its final Part B submittal including the waste stream consideration, DTSC will request ARB to review the air modeling associated with chemicals selected. | The protocol for modeling of non-routine releases was previously submitted to DTSC for approval "Romic Environmental Technologies (EPA ID NO. CAD 981 160 948) – Modeling Protocol for Health Risk Assessment "Non-Routine" Releases" (June 15, 2000). Minor comments were received on the draft protocol from DTSC on June 2, 2000. These comments were incorporated into the final protocol listed above. |
| 3. As indicated in page 7-5, Romic's fire/explosion preventive program consists of 4 categories:<br><br>♦ Fire/explosion suppression and response | As noted in the 2001 HRA, Romic implemented additional safety procedures after the roll-off smoldering incident. In fact, after each historical incident, Romic implemented additional safety measures, either structural or procedural, that served to reduce the risk of such an incident reoccurring. In |

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| systems<br>♦ Process safety program elements implemented to prevent fire/explosion<br>♦ Fire/explosion prevention systems and process unit design features<br>♦ Material profiling and management.<br><br>Pages 7-3 and 7-15 of the HRA state that a fire/explosion scenario in which more than three safety systems fail simultaneously is unlikely. However, as HRA recorded, in December 1999, Romic had experienced fire and smoldering. It is evident that fire can occur even if only one of the safety system is compromised. Please reconsider the statements in pages 7-3 and 7-15 in terms of the likelihood of a fire/explosion<br><br>4. The fire/explosion scenario, as stated in page 7-15, is not analyzed quantitatively for its health risk impact. The rationale for this decision is that Romic considers it unlikely that three safety systems fail simultaneously resulting a fire/explosion. This rationale may need reconsideration. | light of this, Romic believes pages 7-3 and 7-15 of the 2001 HRA do not need to be revisited. |
| 5. Please revise Section 7.1.3.1 Site History to more closely reflect the incidence as stated in the Incidence Report filed in February, 2000 by Romic. Also, please make sure the additional safety procedures stated on page 7-4 are consistent with what presented in the Part B. | The 2001 HRA, under section 7.1.3.1, "Site History," describes Romic's December 1999 incident involving two roll-off containers. The following information supplements that discussion.<br><br>As indicated in the 2001 HRA, the smoldering was believed to have been caused by the presence of small amounts of incompatible liquids contained in some glass bottles. The chemical that is suspected to have caused the incident is vinyl benzyl chloride. Some of the bottles may have broken and the contents reacted with other materials inside the roll-off containers. |
| 6. Given that waste incompatibility led to the smoldering incidences of 1999, please revise the section regarding materials profiling and management (page 7-9) to clearly explain Romic's compatibility evaluation protocols and their improved effectiveness in preventing fires. All information should be kept consistent with the Part B. | This information is offered as a supplement to the text under the heading, "Materials Profiling and Management," within section 7.1.3.2 of the 2001 HRA.<br><br>Compatibility evaluation protocols have been enhanced in the Part B permit renewal application. The protocols involving liquid wastes include measurement of pH, oxidizer and cyanide screens, and bench scale compatibility tests on wastes that will be mixed with other wastes. The protocol for solid wastes to be consolidated with other solid wastes involves a detailed review of profile information, and vigilance while conducting the consolidation process. Romic personnel observe for known and suspect incompatible materials, including oxidizers, batteries containing corrosive liquids, and glass chemical bottles. These materials will be segregated from other wastes and managed separately and appropriately. |

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| 7. A number of statements in Section 7 (Non-Routine Releases) are inconsistent or potentially inconsistent with the Part B application. One of the examples is<br><br>"…refined product solvents are stored in…Tank Farm Q. Blended fuel is typically stored in Tank Farm I" (page 7-3 paragraph 4). This is not mentioned in Part B.<br><br>Please revise it for better consistency. | Refined products typically are stored in tanks not permitted for hazardous waste, most of which are in Tank Farm Q. This does not need to be specified in the Part B, though it may be inferred. Blended fuel is typically stored in Tanks K, L, and M, in Tank Farm A. This is more clearly described in the revised Part B. |
| SECTION 8: EVALUATION OF ODOR IMPACTS<br><br>1. Paragraph 3 of Section 8.1, by referencing Section 3.0, indicates that all chemicals identified on the master facility chemical list with an odor threshold below 1 ppm has been included in the odor impact evaluation. Please point out where in the HRA this statement can be substantiated. | Based on DTSC guidance, the odor thresholds were identified based on a compilation of odor thresholds by Amoor and Huatala (1983). This step is part of the preliminary screen of chemicals and is included in Appendix A. All chemicals meeting the criteria are noted in Appendix A, Table 2 (Preliminary Selection of Chemicals). |
| 2. At this time, DTSC has not requested the ARB to review the methodology for odor impact evaluation, specifically the use of 1.64 as the factor of concentration extrapolation. When Romic completes its final Part B submittal including the waste stream consideration, DTSC will request ARB to review the subject methodology associated with chemicals selected. | The methodology used to evaluate odor impacts was explicitly stated in the "Work Plan for Human Health Risk Assessment and Ecological Risk Assessment Part B Permit for Romic's East Palo Alto Facility" (January 6, 1999) approved by DTSC on February 3, 1999. |
| 3. According to BAAQMD complaint database, there have been a total of 11 complaints recorded between August 1, 1990 and April 1, 2001. Two of them, one on September 27, 1995 and the other on July 21, 1998, have been confirmed. Please revise Section 8 to more closely reflect the AQMD records. | The 2001 HRA was correct in stating that there had been no odor citations in the three years preceding the report and few odor complaints in the last two years. It is correct that there were 11 complaints recorded between August 1, 1990 and April 11, 2001 with only two of them confirmed. Only two of these complaints were received in the two years preceding the report. |
| 4. Please clarify if the statement, "There have been no citation for odor violations (at least 3 years)" is based on any AQMD records. | According to the BAAQMD records received from DTSC, there were no odor violation notices between August 1, 1990 and April 11, 2001. |
| SECTION 9: ECOLOGICAL ASSESSMENT<br><br>1. Please refer to Attachment II for review comments on ecological assessment. | See Attachment II for responses to specific comments. |
| ATTACHMENT I. BAAQMD COMMENTS ON AIR DISPERSION MODELING AND HUMAN HEALTH RISK CALCULATION | |

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| 1. Assumptions regarding the duration of exposure for an "average exposed individual" (AEI) and a "reasonable maximum exposure" (RME) are listed in Section 4.4.3 of the report. These scenarios assume exposure durations of 9 and 30 years for residential receptors, and 6.6 and 25 years for off-site worker receptors (for AEI and RME, respectively). In their guidance on estimating health risks for the Air Toxics Hot Spots Program, Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) recommends that risk estimates also be conducted for 70-year exposure durations. For offsite workers, OEHHA has recommended using a working lifetime of 56-years. We therefore recommend that, in addition to the AEI and RME scenarios, health risks be calculated based on these 46 and 70-year exposure durations (for off-site workers and residences, respectively). | This risk assessment has been conducted according to DTSC guidelines. These guidelines include "Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities" (July 1992) and "Permitting of Treatment, Storage and Disposal Facilities (TSDF), Items to be considered for Inclusion in a Health Risk Assessment" (1991).<br><br>The Air Toxics Hot Spots Program requires conservative assumptions in order to maintain consistency across sites in the program. As this site is not currently being evaluated for that program, the applicable guidance is the DTSC guidance for risk assessment. The DTSC guidance explicitly states the exposure durations to be used in the evaluation. |
| 2. The UTM coordinate system used to locate sources and receptors in the dispersion modeling analysis does not seem to be based on the two most commonly used datum's (NAD 27 and NAD83/WGS84). This should not effect the results, however, as source and receptor locations appear to be correct relative to one another. | The coordinate system used in the 2001 HRA is UTM NAD 27. All coordinates are provided in units of meters (not kilometers). ENVIRON agrees with the BAAQMD that the use of different coordinate systems would not effect the results since the source and receptor locations are correct relative to one another. |
| 2. The site of the maximum off-site air pollutant concentrations appears to be immediately south of the facility boundary line (as depicted in several figures given in the report). The air dispersion modeling analysis completed does not, however, place receptors in this area. Further review of the status of this maximum impact area indicates that it consists of land parcels (San Mateo County Parcels 63-12-49 and 63-12-12) that are owned by Romic. The final report should clarify that this area owned by Romic was not considered in the analysis because public exposure would not be expected to occur. | It is correct that the property owned by Romic including the Parcels listed, were not included in the off-site evaluation. |
| ATTACHMENT II DTSC HUMAN AND ECOLOGICAL RISK DIVISION COMMENTS<br><br>GENERAL COMMENTS<br>The submitted document was reviewed for its sound risk assessment methodology and scientific content. Minor errors or editing flaws | <br><br><br><br>No response needed. |

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| that do not affect the technical interpretation have not been noted. Since there was no site visit by the staff of HERD and we have not scrutinized the waste processes and waste types, we must rely on your judgment that the full and accurate input data for emission modeling and calculations have been provided by Romic. | |
| SPECIFIC COMMENTS<br>1. Hazard Identification, Chapter 3, and Selection of Chemicals for Risk Assessment, Appendix A<br><br>HERD has previously reviewed a chemical selection process submitted by Romic on September 21, 1999. Such process of identifying the chemicals of concern for the site was deemed adequate at that time. That report has been updated and is included as Appendix A. | |
| Two observations should be noted here: One, the master list of 322 chemical entries was compiled from waste manifests of material received at the site from October 1997 through September 1998. Romic, as a TSD facility, receives an extremely diverse chemicals from a highly varied sources. The scope of HRA and ERA on hand is to encompass both the current and future use of the subject facility. Thus, a safeguard should be put in place to ensure that toxic chemicals not included in the original master list will be reported and accounted for in the HRA/ERA. | See response to Section 3, Comment 1. |
| The other observation: Section 3.1 has changed from "Identification of Chemicals from Operation and Soil Emissions" to "Identification of Chemicals from Operation Emissions", i.e., soil gas emissions have been removed from current HRA consideration. Apparently, DTSC and Romic agreed that contaminated groundwater and associated soil gas emissions will not be discussed here in HRA/ERA, but to be addressed under EIR. | Correct. The current ongoing remediation to address groundwater (and potential emissions from groundwater) will be addressed in the EIR. |
| 2. Exposed populations and Exposure Pathways, Chapter 4<br>The report is correct in stating that potential current and future on-site receptors would include on-site workers and visitors. And, for on-site receptors, it is adequate to only evaluate the workers | No response needed. |

| DTSC COMMENT | ROMIC RESPONSE |
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| because any health risks to visitors would be lower than that for the workers. | |
| In the first paragraph of Section 4.1, the sentence "only the on-site worker is quantitatively evaluated in the risk assessment" should be revised. It implies that on-site worker exposure has been subject to risk characterization as described in Chapter 6. Instead, health hazard evaluation consists of comparing worker exposure data with Cal-OSHA's Permissible Exposure Limit (PEL) values. The approach is appropriate; it only needs clarification and avoids confusion by referring to proper sections (5.4, 6.7, Table 6.10, etc.). | It is correct that monitoring data has been used to evaluate the onsite worker. The comparison of worker exposure data with Permissible Exposure Limit (PEL) values is presented in Table 6.10. |
| The Conceptual Site Model (CSM, Figure 4.1) also depicts the off-site residents, workers, and other sensitive population as potential receptors. Because the entire site is paved, inhalation is identified as the only exposure pathway of concern. For exposure assumptions, it is correct to include both the reasonable maximum exposure (RME) and average exposed individual (AEI). | No response needed. |
| 3. <u>Estimation of Exposure Concentrations, Chapter 5</u><br>This chapter describes the information and data used to estimate the concentrations of chemicals in the ambient air near the site, for off-site exposures. The air dispersion model is used for such estimation which is the USEPA-approved Industrial Source Complex Short-Term Version 3 (ISCST3) model. HERD generally refers such review to BAAQMD. | No response needed. |
| The use of the ISCST3 model is appropriate. However, to obtain sound estimation of airborne exposure concentrations, the input data must be scientifically sound. To that end, DTSC and BAAQMD should be provided with full information and data on the nature and the quantity of source material, flow rate and other engineering details, and all operating parameters for the sources. | All information has been provided to BAAQMD as requested. |
| 5. <u>Risk Characterization, Chapter 6</u><br>Methodology for risk estimation was adequately presented in this chapter. Results of human health risks for current | No response needed. |

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| and future off-site receptors were summarized and presented in tables in this chapter and in the Executive Summary section. Among the off-site receptors, workers exhibit the highest potential cancer risks: 6.6E-06 and 1.2E-06 for current RME and AEI scenarios, respectively; 7.0E-06 and 1.2E-06 for future RME and AEI scenarios, respectively. All Hazard Index values are below 1.0.<br><br>As commented earlier (#2), on-site worker exposure was monitored (rather than modeled for off-site receptors) and compared to and met occupational health standards, i.e., Cal-OSHA's PELs (Section 6.7 and Table 6.10). | It is correct that monitoring data has been used to evaluate the onsite worker. The comparison of worker exposure data with Permissible Exposure Limit (PEL) values is presented in Table 6.10. |
| 6. HERD's present task is to review HRA and ERA. As such, for this current memorandum, we have no comments on Chapter 7 (Non-Routine Releases) and Chapter 8 (Odor Impacts). | No response needed. |
| CONCLUSION<br><br>The submitted document, "Draft Human Health Risk Assessment and Ecological Risk Assessment for Romic's East Palo Alto Facility", is generally well organized. As stated in our Specific Comments, our concerns include:<br>a) A safeguard is needed to ensure that future arrivals of new toxic chemicals will be reported and accounted for in the HRA/ERA. | See response to Section 3, Comment 1. |
| b) The upcoming EIR for the site should address groundwater contamination and the associated soil gas emissions. | The EIR will be prepared by TRC. We assume this will be included. |
| c) The report should make clearer how the on-site worker exposure has been evaluated. | Monitoring data has been used to evaluate the onsite worker. The comparison of worker exposure data with Permissible Exposure Limit (PEL) values is presented in Table 6.10. |
| d) To properly evaluate the air emission/dispersion data, DTSC and BAAQMD should be provided with full information and data on the nature and quantity of source material, flow rate and other engineering details, and all operating parameters for the sources. | All information requested by DTSC and BAAQMD has been provided. |
| e) It is not clear whether the Ecological Risk Assessment (ERA) submitted meets the scope specified by the approved workplan. | The methodology used to conduct the ecological risk assessment was stated in the "Work Plan for Human Health Risk Assessment and Ecological Risk Assessment Part B |

| DTSC COMMENT | ROMIC RESPONSE |
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| | Permit for Romic's East Palo Alto Facility" (January 6, 1999) approved by DTSC on February 3, 1999. |
| ATTACHMENT III LIST OF SOME DISCREPANCIES BETWEEN PART B AND HRA | |
| Tank 21: HRA: Handles sodium hydroxide only; Part B: Handles a variety of organic liquids or aqueous liquids with up to 10% organics (Draft Table D2-1) | The Part B has been revised to show that Tank 21 handles sodium hydroxide only (Table D-2). |
| Tanks AES-1 through AES-4: HRA: Handles ethylene glycol only; Part B: Handles a variety of organic liquids or aqueous liquids with up to 10% organics (Draft Table D2-1) | The Part B has been revised to show that Tanks AES-1 through AES-4 handle ethylene glycol only (Table D-2). |
| Tanks N-1 through N-3: HRA: Handles no volatile materials; Part B: Could handle up to 50% of acids that are considered chemicals of concern (e.g. H2SO4, HNO3, HCl and HF); Waste acids and alkalis could contain up to 50% organics (e.g. methanesulfonic acid) which are not in the original 248 chemicals considered in the chemical selection (chemical selection dated 9/21/99 and Draft Appendix C-1) | The Part B (Table D-4) has been revised to show that Tanks N-1, N-2, and N-3 will handle acid and alkaline materials. These could include sulfuric acid, nitric acid, hydrochloric acid, and hydrofluoric acid. Table C-5 further indicates that materials handled in this process may have up to 1% organics. These tanks were further evaluated to determine if there are any potential emissions that needed to be addressed in the HRA Addendum. Emissions of the acid and alkaline materials in the tanks are assumed to be negligible as these materials are not agitated. Organic emissions from these tanks are also expected to be negligible. These three tanks are located in the Zone #4 source group included in the HRA Addendum. Emissions from Zone #4 were based on seven tanks that contain up to 50% organics. Therefore, emissions from Tanks N-1, N-2, and N-3 would represent less than 1% of the emissions from Zone #4 as included in the HRA Addendum. |
| Rotary Vacuum Filter: HRA: Unit not identified; Part B: Unit identified (Draft Table D3-1) | Romic has removed the Rotary Vacuum Filter from the revised Part B application. |
| SF-1 through SF-2, UF, B-5, B-6, B6-A, B-7, B-8 & UV/OX System: HRA: No emission assumed; Part B: Lacks sufficient information to collaborate with the "no emission" assumption | Biological wastewater processing at the Facility occurs in a series of units. First, the wastewater is processed in Tanks B-2 and T-13. Then the wastewater is processed in Tanks 3 and 3A, and Tanks 4 and 4A. After processing in these tanks, the wastewater goes through the remaining units (SF-1 through SF-2, UF, B-5, B-6, B6-A, B-7, B-8 & UV/OX System). Prior to going through these remaining units, the majority of volatile organic material in the wastewater will have already volatilized. Therefore, the emissions have occurred and are being accounted for in the emissions from T-13, B-2, 3, 3A, 4, and 4A. This information has been included in the revised Part B Permit. |
| Liquid-Liquid Extraction Column and Reboiler: HRA: Unit vented to the VOC Abatement System; Part B: Lacks sufficient information (e.g., piping diagram) to collaborate with the | The Part B has been revised to indicate that this equipment vents to the VOC abatement system. |

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| Oil Filter: HRA: Handles ethylene glycol only; Part B: Handles a variety of organic liquids or aqueous liquids with up to 10% organics (Draft Table D3-1) | Removed from revised Part B. |
| Drum Crusher: HRA: Deminimis emission; Part B: Lacks sufficient information (e.g. equipment specification) collaborate with the HRA | This unit handles only drums that are empty according to 22 CCR 66261.7. |
| Bulking/consolidation: HRA: Deminimis emission; Part B: Lacks sufficient information to collaborate with the HRA | The revised Part B reflects consolidation of solid wastes (potentially containing incidental free liquids) within an enclosure with vent controls. Emissions will be vented to the air via an elevated stack rather than to allowed to vent passively. A fan would maintain a positive flow of air out of the enclosure. In the 2001 HRA, this source was represented in dispersion modeling as a volume source (a source which has emissions with no momentum and originating from a volume of space rather than a point). The HRA Addendum was updated to be consistent with the revised Part B. The same emissions from a stack (a point source of emissions with momentum) were evaluated. |
| Carbon Regeneration: HRA: Unit vented to the VOC Abatement System; Part B: Lacks sufficient information (e.g. piping diagram) to collaborate with the HRA | Removed from revised Part B. |
| Liquefaction Product Tank: HRA: Unit vented to the Tidy Bowl VOC Abatement System; Part B: Lacks sufficient information (e.g. piping diagram) to collaborate with the HRA | The Part B has been revised to specify that the liquefaction product tank be vented to the liquefaction VOC abatement system. |
| Tanks 78 through 82: HRA: Same as Tanks 101 through 104; Part B: Identified as proposed units | This comment actually refers to tanks that were numbered 78, 79, 80, and 82 under a previous numbering system. These tanks are currently numbered 101, 102, 103, and 104, respectively. Both the 2001 HRA and the revised Part B refer to these tanks as Tanks 101-104. The 2001 HRA includes the previous tank numbers in addition to the current numbers, for informational purposes. The revised Part B does not identify any of these tanks as proposed units. No corrections or changes are necessary. |
| Filter Press: HRA: Deminimis emission; Part B: Lacks sufficient information to collaborate with the HRA | The revised Part B indicates that the filter press, as part of the Inorganic Treatment System, will handle waste streams with less than or equal to 10% organics (Table C-5). Potential emissions from the Inorganic Waste Treatment System were reviewed and addressed in the HRA Addendum. |
| Stabilization Roll-Off Box: HRA: Deminimis emission; Part B: Sufficient information to collaborate with the HRA | Generally, waste processed is inorganic in nature and contains less than 500 ppmw of VOC. The stabilization roll-off box was further evaluated to determine if there are any potential emissions that needed to be addressed in the HRA Addendum. Based on the design of the roll-off bins, and in compliance |

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| | with the applicable regulations, emissions from solid hazardous wastes stored in roll-off bins at the Site are assumed to be negligible. |
| Solvent Recovery C34 and R34: HRA: Emission accounted for in the boiler; Part B: Lacks sufficient information to collaborate with the HRA | The revised Part B (Section M2) specifies that process vents listed in Table M-1, including those associated with planned 34" Distillation Column, will be vented to the VOC control system. |
| Thin Film TF-4 and receiving tank: HRA: Emission accounted for in the boiler; Part B: Lacks sufficient information to collaborate with the HRA | The revised Part B (Section M2) specifies that process vents listed in Table M-1, including those associated with planned Thin Film Evaporator TF4, will be vented to the VOC control system. |
| Paint Can Crusher: HRA: Not identified; Part B: Identified | The Paint Can Crusher has been removed from the revised Part B. |
| Drum Wash: HRA: Deminimis emission; Part B: Lacks sufficient information to collaborate with the HRA | The Drum Wash has been removed from the revised Part B. |
| Aerosol Depressurization: HRA: Not identified; Part B: Identified | Potential emissions from this unit were reviewed and addressed in the HRA Addendum. |
| Carbon Regeneration: HRA: Emission accounted for in the boiler; Part B: Lacks sufficient information to collaborate with the HRA | The carbon regeneration process has been removed from the revised Part B. |
| Liquefaction: HRA: Sludges in drums is cleared out with diesel to make blended fuel, and solid waste is shredded and blended with fuel mixture; Part B: No shredded solid wastes are blended (based on Romic personnel's comments received during Part B working meeting) | The Liquefaction unit contains a shredder. This shredder, an integral part of the Liquefaction process, reduces the particle size of sludges and incidental solids in drums processed through the unit. This enables entrained solids to remain in suspension.<br><br>There is a Shredder at the Romic facility that is separate from the Liquefaction unit. This Shredder is used to size reduce solid wastes. The shredded material from the Shredder unit is not blended into the liquid fuel stream, either through Liquefaction or liquid fuel blending. We qualitatively included the solids shredder as part of solid waste consolidation. We had determined, based on the description of the material handled in this operation, that emissions would be insignificant. Materials processed through the Shredder unit are shipped off-site as solids. |
| Fuel Blending: HRA: 8 tanks (K-M, R91-95); Part B: All tanks (based on Romic personnel's comments received during Part B working meeting) | Romic has distinguished in the Part B fuel blending that occurs in agitated tanks from fuel blending that occurs in non-agitated tanks. The fuel blending conducted in Tanks K-M and R91-R95 includes agitation. Because this activity involves agitation, there is greater concern for organic emissions arising from fuel blending in these tanks. Note that the emissions from these tanks are controlled via vapor collection and VOC recovery. The fuel blending conducted in other tanks does not include agitation, but is incidental to storage. The emissions resulting from this activity are appropriately modeled as emissions from the storage of organic liquids. |