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## Human Health Risk Assessment 29508 Roadside Drive Agoura Hills, California 91301

## December 23, 2015

**Prepared for:** 

Agoura Hills HHG Hotel Development LP 105 Decker Court, Suite 105 Irving, Texas 75602

**Prepared by:** 

Mearns Consulting LLC 738 Ashland Avenue Santa Monica, California 90405

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December 23, 2015

<u>via email</u>

Ms. Patricia Santini Agoura Hills HHG Hotel Development LP 105 Decker Court, Suite 105 Irving, Texas 75602

#### RE: Human Health Risk Assessment 29508 Roadside Drive, Agoura Hills, California 91301

Dear Ms. Santini:

I am pleased to present this Human Health Risk Assessment (HRA) for the 5.65-acre property located at 29508 Roadside Drive in Agoura Hills, California (the site) pursuant to your authorization. The site is planned for a three-story hotel development.

This HRA followed the guidance in the Department of Toxic Substances Control (DTSC) *Preliminary Endangerment Assessment* (PEA) guidance manual (DTSC 2013), U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (RAGs) (USEPA 2004), the U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (Part F, Supplemental Guidance for Inhalation Risk Assessment) (USEPA 2009), the Massachusetts Department of Environmental Protection (MADEP) *Characterizing Risks posed by Petroleum Contaminated Sites* manual (MADEP October 31, 2002), the DTSC LeadSpread 8.0 Model and the DTSC modified Johnson & Ettinger groundwater screen, USEPA version 3.0 model (April 2003), modified by DTSC Office of Human and Ecological Risk (HERO) December 2014.

This human health risk assessment assessed the potential risk and hazard attributable to exposure to 21 constituents, including lead.

DTSC's LeadSpread 8.0 Model results indicate that lead does not pose an unacceptable hazard to adults and children in a residential exposure scenario.

The Johnson & Ettinger groundwater screen model results indicate that the volatile organic compounds: benzene, toluene, ethylbenzene, total xylenes, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene detected in perched shallow discontinuous groundwater do not pose an unacceptable hazard to adults and children in a residential exposure scenario or to adults in a commercial scenario. The J&E model does indicate the estimated risk due to inhalation of benzene detected in perched shallow discontinuous groundwater is slightly greater than the target threshold for a residential scenario and less than the target threshold for the commercial scenario.

Even though the noncarcinogenic constituents impact different target organs the estimated hazard quotients of each constituent were summed to provide a hazard index. The results of the HRA indicate that the estimated individual hazard quotients of the noncarcinogenic constituents detected in the soil matrix is less than 1, the target hazard threshold.

The results of the HRA indicate that the estimated individual and summed risks of the carcinogenic constituents detected in the soil matrix are less than  $1 \times 10^{-6}$  the target risk threshold for all residential populations and less than  $1 \times 10^{-5}$  the target risk threshold for the commercial and construction worker populations.

Therefore this site does not pose an unacceptable adverse impact to future extended-stay or short-term stay hotel guests, commercial workers or future construction workers. Additionally, the soil onsite is not hazardous and does not need to be removed from the site.

Should you have any questions or desire additional information, please do not hesitate to contact me at 310.403.1921.

Sincerely,

XSusan Mearns

Susan L. Mearns, Ph.D.

**Mearns Consulting LLC** 

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#### **EXECUTIVE SUMMARY**

The objective of this Human Health Risk Assessment (HRA) is to evaluate potential health risks to human receptors posed by concentrations of constituents detected at least one time in the soil matrix and shallow perched groundwater underlying the 5.65-acre property located at 29508 Roadside Drive in Agoura Hills California (the site). A three-story hotel with surface level parking and below ground swimming pool is the planned development onsite.

This HRA followed the guidance in the Department of Toxic Substances Control (DTSC) *Preliminary Endangerment Assessment* (PEA) guidance manual (DTSC 2013), U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (RAGs) (USEPA 2004), the U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (RAGs) (USEPA 2004), the U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (Part F, Supplemental Guidance for Inhalation Risk Assessment) (USEPA 2009), the DTSC *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, October 2011), the Massachusetts Department of Environmental Protection (MADEP) *Characterizing Risks posed by Petroleum Contaminated Sites* manual (MADEP October 31, 2002), the DTSC LeadSpread 8.0 Model and the DTSC modified Johnson & Ettinger groundwater screen, USEPA version 3.0 model (April 2003), modified by DTSC Office of Human and Ecological Risk (HERO) December 2014.

As the property is to be developed as a hotel development including an extended stay hotel, the maximum detected concentrations of the constituents detected in the soil matrix and in the perched shallow discontinuous groundwater at 8-feet below ground surface (bgs) were selected as the exposure point concentrations, for the residential receptor scenario. The maximum detected concentrations of the volatile organic compounds detected in the perched shallow groundwater were selected as the exposure point concentrations for the commercial scenario. The maximum detected concentration or the upper confidence level of the constituents detected in the soil matrix, whichever was lower pursuant to the ProUCL guidance (USEPA 2004), was used as the exposure point concentration for the commercial worker and construction worker scenarios. Those chemicals of concern that had both reference doses or reference concentrations and slope factors or unit risk factors available, were assessed as both noncarcinogenic and carcinogenic compounds.

DTSC's LeadSpread 8.0 Model estimates the hazard due to exposure to lead in air and onsite soils/dust for adults and children within a residential scenario. Typically lead concentrations in air are not measured onsite. Therefore the model extrapolates these concentrations from the measured concentrations of lead in onsite soils. The percentile blood lead concentration is estimated by the model to provide an estimate of the percentage of a population of children and adults that would be expected to have blood lead levels that exceed the threshold value for a residential exposure scenario.

DTSC's LeadSpread 8.0 Model results indicate that lead does not pose an unacceptable hazard to children or adults in a residential exposure scenario.

The Johnson & Ettinger groundwater screen model modified by DTSC HERO (December 2014) was used to assess the potential risks and hazards due to exposure to the maximum concentrations of the volatile organic compounds (VOCs): benzene, toluene, ethylbenzene, total xylenes, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene detected in the discontinuous shallow groundwater (at 8-feet bgs) for residential and commercial exposure scenarios. The Johnson & Ettinger model estimated a risk of  $1.4x10^{-6}$  (slightly greater than the residential threshold  $1x10^{-6}$ ) and a hazard less than the threshold of 1 for the residential

scenario. The estimated risk and hazard for the commercial scenario were less than the thresholds of  $1 \times 10^{-5}$  and 1 indicating these VOCs do not pose an unacceptable risk or hazard to children or adults in a residential scenario or to commercial or construction workers.

Even though the noncarcinogenic constituents impact different target organs the estimated hazard quotients (HQ) of each constituent detected in the soil matrix were summed to provide a hazard index. The results of the HRA indicate that the estimated summed hazard index (HI) of the noncarcinogenic constituents did not exceed the target hazard threshold for the residential adult, commercial worker and construction worker scenarios.

The results of the HRA indicate that the estimated individual risks of the carcinogenic constituents detected in the soil matrix are less than 1 x  $10^{-6}$  the target risk value for the residential scenarios and less than 1 x  $10^{-5}$  the target risk threshold for the commercial and construction worker scenarios.

Although arsenic was detected in onsite soils, based on a comparison to DTSC-accepted background concentrations in Southern California soils it was determined that arsenic detected in onsite soils is naturally occurring and therefore arsenic was eliminated as a chemical of concern and not quantitatively assessed in this HRA.

Therefore this site does not pose an unacceptable adverse impact to future long-term or short-term hotel occupants, future construction workers or future commercial workers.

#### **1.0 INTRODUCTION**

This report presents the results of a Human Health Risk Assessment (HRA) for the 5.65-acre property located at 29508 Roadside Drive in Agoura Hills, California (the site) (Figure 1).

The purpose of this human health risk assessment is to evaluate the potential adverse health impacts due to exposure to concentrations of constituents detected in the soil matrix and shallow perched discontinuous groundwater underlying the site. If a constituent was detected one time in the soil matrix or shallow perched groundwater, it was retained and quantitatively assessed in this human health risk assessment. This human health risk assessment assessed the potential risk and hazard attributable to exposure to five carcinogenic constituents and 16 noncarcinogenic constituents, including lead.

This HRA followed the guidance in the Department of Toxic Substances Control (DTSC) *Preliminary Endangerment Assessment* (PEA) guidance manual (DTSC 2013), U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (RAGs) (USEPA 2004), the U.S. Environmental Protection Agency *Risk Assessment Guidance for Superfund volume 1, Human Health Evaluation Manual* (Part F, Supplemental Guidance for Inhalation Risk Assessment) (USEPA 2009), the DTSC *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, October 2011), the Massachusetts Department of Environmental Protection (MADEP) *Characterizing Risks posed by Petroleum Contaminated Sites* manual (MADEP October 31, 2002), the DTSC LeadSpread 8.0 Model and the DTSC modified Johnson & Ettinger groundwater screen, USEPA version 3.0 model (April 2003), modified by DTSC Office of Human and Ecological Risk (HERO) December 2014.

As the USEPA and the State of California Office of Environmental Health Hazard Assessment (OEHHA) have not published toxicity values, i.e., Reference Doses (RfDs), for total petroleum hydrocarbons the guidance in the Massachusetts Department of Environmental Protection approach to characterizing risks posed by petroleum contaminated sites and in DTSC's PEA Manual (DTSC 2013) were used to obtain surrogate RfDs for C18-C28, C28-C36 and C36-C40 (MADEP 2002, DTSC 2013). The potential adverse health impacts due to exposure to C18-C28, C28-C36 and C36-C40 in onsite soils were then assessed by following the appropriate ingestion and dermal contact equations (DTSC 2013).

#### 2.0 SITE BACKGROUND

#### Background

The 5.65-acre site is undeveloped irregularly shaped land bounded by Roadside Drive and the 101 Freeway to the north, a construction equipment rental company to the east, the Los Angeles County Animal Shelter to the west and by Agoura Road to the south. The site is located in a historical stream drainage area (Geocon 2015). Several natural terraces are located throughout the site; surface water drainage appears to be by stream flow from the west along existing channels to the center of the site where a concrete flood control structure has been constructed. Onsite vegetation consists of oak trees and shrubs.

The site was developed in the 1970s for commercial use; a building in the northeast portion of the site housed a wine retail store in 1985. The structure was demolished in the 1990s and the site has remained vacant undeveloped land. The area surrounding the site is developed with commercial and industrial enterprises (Hillmann Consulting May 13, 2015). The northwestern portion of the site is graded to street level but the east, west and southern portions of the site have an 8-foot slope (Hillmann Consulting May 13, 2015).

The proposed development will consist of a three-story hotel surrounded by paved parking. The center of the proposed hotel development will have a recreation area and below ground swimming pool (Figure 2).

#### Previous Environmental Investigations

A Phase I Environmental Site Assessment (Phase I ESA) was completed in November 2006 (Geocon 2006). Geocon observed a large soil stockpile consisting of debris, including concrete, asphalt, piping and wood, in addition to soil (estimated to be between 5,000 and 10,000 cubic yards) on the central and northeastern portions of the site (Figures 3 & 4). Geocon identified the soil stockpile as a potential recognized environmental condition.

Limited soil sampling to characterize the soil stockpile was performed using a hydraulic push drill rig to continuous core to a maximum depth of 10 feet below ground surface (bgs) (Geocon January 2007). Six soil borings were advanced and soil samples were collected in 2-inch diameter acetate liners. The acetate was cut at desired sampling depths, sealed with Teflon sheets and plastic end caps, labeled, placed in a cooler with ice until delivered under chain of custody to Advanced Technology Laboratories, a NELAC certified laboratory located in Signal Hill, California for analysis of arsenic and lead by EPA method 6010, extended range total petroleum hydrocarbons (carbon range C8 through C40) by modified EPA method 8015B, and organochlorine pesticides by EPA method 8081A. Analytical data is included as Appendix A.

The analytical results are summarized below and presented in Tables 1 & 2:

- Arsenic was reported in seven of the fifteen samples at concentrations ranging from 3.1 to 9.8 milligrams per kilogram (mg/kg).
- Lead was reported in eleven of the fifteen samples at concentrations ranging from 1.1 to 6.1mg/kg.
- Total TPH (C8-C40) was reported in eight of the fifteen samples at concentration ranging from 35 to 100mg/kg.
- Pesticides were not reported at concentrations equal to or greater than the reporting limits of 1.0, 2.0 or 8.5 micrograms per kilogram (μg/kg).

Geocon identified three neighboring properties to the east of the site that had leaking underground storage tanks: (1) Agoura Equipment Rental, (2) Hillside Rubbish and (3) Agoura Building Materials (Geocon 2007). The Los Angeles Regional Water Quality Control Board (LARWQCB) closed all three leaking

underground storage tank cases in 1996, 1997 and 2004 using the following rationale - the sites are not located above any aquifers, there is no possibility of surface discharge, the subsurface lithology consists of sandy clays and bedrock, and it does not appear that contamination has migrated vertically beneath the bedrock barrier. Geocon concluded that there was no evidence these three properties had adversely impacted the site.

A Phase I ESA was completed in May 2015 (Hillmann Consulting May 13, 2015). Hillmann identified fill material deposited onsite in the 1970s, 1980s and 1990s, particularly in the southern portion of the site. Additionally Hillmann identified adjacent properties east of the site that had historic leaking underground storage tanks and that had closure from the LARWQCB in 1996, 1997 and 2004.

#### 3.0 SUMMARY OF FIELD ACTIVITIES

Hillmann Consulting installed eight soil borings using a hollow stem auger to depths ranging from 15 to 30 feet bgs (Hillmann Consulting December 18, 2015). Borings B7 and B8 were installed along the east site boundary; within the northern soil pile and former stream bed fill, respectively (Figure 4). Borings B9 and B10 were installed in the stream bed area and borings B11-B14 were installed in the soil pile (Figure 4).

During drilling, soil samples were collected at select intervals for laboratory analysis. A California Professional Geologist used a photo-ionization detector (PID) to screen the soil samples in the field for the presence of volatile organic compounds (VOCs). The soil samples were preserved for analysis using the EnCore sampling method (EPA Method 5035). Hillmann selected soil samples and submitted them for analysis of carbon chain hydrocarbons, VOCs, and heavy metals by Cal Tech Environmental Laboratories, Inc. (ELAP ID 2424) of Paramount, California (Hillmann Consulting December 18, 2015).

Hillmann placed a temporary PVC casing in each boring at maximum depth and allowed groundwater (if any) to accumulate for at least 2 hours for sampling. Sufficient groundwater accumulated in only two of the eight borings, B7 and B10, both drilled at lower elevations onsite. Grab groundwater samples were collected from the borings using a Teflon bailer. The temporary casings were removed from the borings and each bore hole was sealed with a mixture of bentonite and cuttings. Hillmann installed a soil gas sampling probe at depths ranging from 5 to 15 feet bgs after completion of soil and groundwater sampling (Hillmann Consulting December 18, 2015).

The analytical results indicated none of the soil samples had levels of carbon chain hydrocarbons or VOCs detected at concentrations greater than their respective detection limits. Ten metals were detected, however, only arsenic and cadmium were detected at concentrations greater than the USEPA Region IX Regional Soil Screening Levels for residential land use (USEPA November 2015).

The analytical results of in-situ groundwater grab sampling indicated low concentrations of benzene, toluene, ethylbenzene, total xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and metals (Table 3).

The soil vapor analytical results indicated VOCs were not detected in concentrations greater than their respective detection limits of 0.5, 1.0, 10 or 50  $\mu$ g/L. Analytical results are included as Appendix B.

#### 4.0 CONCEPTUAL SITE MODEL

A conceptual site model was developed to identify the potential complete exposure pathways by which constituents detected in soil could impact human health (Figure 5).

The conceptual site model identifies potential sources, environmental release mechanisms, potential migration pathways, potential exposure pathways, potential exposure routes and potential human receptors onsite.

The conceptual site model identified the following potential complete exposure pathways:

- Future onsite commercial worker
  - ingestion/dermal contact with surface soil
  - inhalation of dust from soil in outdoor air
- Future construction worker
  - ingestion/dermal contact with surface and subsurface soil
  - inhalation of dust from soil in outdoor air
- Future onsite resident
  - ingestion/dermal contact with surface and subsurface soil
  - inhalation of dust that has migrated to indoor air
  - inhalation of groundwater vapor that has migrated to indoor air

Consumption of fruit or vegetables grown in soil is not considered to be a complete potential exposure pathway under future site conditions because the site will be developed as a three-story hotel with below ground pool and concrete parking.

Potential direct exposures (ingestion and dermal contact) to groundwater are not complete pathways as drinking water is provided by a remote municipal water supply, so there is little chance of incidental exposure. Discharge of groundwater to surface water also is not considered to be a complete migration pathway since there are no surface water bodies that are recharged by artesian flow or groundwater seepage in the vicinity of the site.

The potential for chemicals in soil to leach to underlying groundwater used as a drinking water source is considered very low as several aquitards or aquicludes exist below the maximum depth of impacted soils and groundwater used as a drinking water source.

There is very limited ecological habitat at and near the site. Wetlands were not observed onsite or at adjacent sites. Also no pits, ponds or lagoons were observed onsite. There are no natural or undisturbed areas onsite. Based on the lack of viable ecological habitat at and near the site, there are no complete ecological pathways onsite.

#### 5.0 IDENTIFYING CHEMICALS OF CONCERN

All constituents detected at least one time in the soil matrix and shallow perched discontinuous groundwater underlying the site were quantitatively assessed using the appropriate exposure pathway in this risk assessment except arsenic which was detected within Southern California regional background concentrations.

Pursuant to the following guidance documents, *Selecting Inorganic Constituents as Chemicals of Concern* for Risk Assessments at Hazardous Waste Sites and Permitted Facilities (DTSC 1997), Background Metals at Los Angeles Unified School Sites – Arsenic (DTSC 2005) and Arsenic Strategies, Determination of Arsenic Remediation, Development of Arsenic Cleanup Goals (DTSC 2009) the concentrations of arsenic detected in the soil matrix onsite were found to be within Southern California background concentrations of 12mg/kg.

The conclusion therefore is reached that arsenic is present at the site at concentrations consistent with background concentrations and therefore was eliminated as a chemical of concern and was not quantitatively assessed in the risk assessment.

#### 6.0 TOXICITY ASSESSMENT

Toxicity values are combined with exposure factors to estimate noncancer adverse health effects and cancer risks. Toxicity values include reference doses (RfDs), reference concentrations (RfCs), unit risk factors (URFs) and slope factors (SFs) that are used to evaluate noncancer adverse health effects and cancer risks. USEPA (1989) has developed the following hierarchical toxicity identification protocol:

- Integrated Risk Information System (IRIS, USEPA 1999b)
- Health Effects Assessment Summary Tables (HEAST, USEPA 1997b)
- National Center for Environmental Assessment (NCEA)

The State of California Office of Environmental Health Hazard Assessment (OEHHA) and the State of California Department of Toxic Substances Control (DTSC) Office of Human and Ecological Risk (HERO) have developed URFs SFs, RfCs and RfDs. Pursuant to regulatory agency guidance OEHHA's and HERO's values are preferentially used instead of USEPA's when available, as OEHHA's and HERO's values are generally more conservative than USEPA's (DTSC 2013, USEPA 2004).

If a constituent had both a risk factor and a reference concentration it was assessed as a carcinogen and as a noncarcinogen. The unit risk factors and reference concentrations were obtained from DTSC HERO (DTSC 2014), ATSDR, IRIS, OEHHA, PPRTV as listed in USEPA's Regional Screening Levels (November 2015).

The slope factors for nickel were obtained from OEHHA. The reference doses and or reference concentrations barium and zinc were obtained from USEPA, IRIS.

The reference concentration for the inhalation exposure route for barium and the reference dose for the oral exposure route for copper are from USEPA, HEAST. The reference dose for vanadium is derived by USEPA within Section 5, Regional Screening Levels (USEPA 2008). The reference doses for C18-C28, C28-C36 and C36-C40 are from MADEP and DTSC.

The exposure point concentrations, the slope factors and reference doses for the constituents detected in the soil matrix and quantitatively assessed are presented in Table 4.

#### 6.1 Types of Toxicity Values

USEPA recognizes that fundamental differences exist between noncarcinogenic and carcinogenic effects of chemicals. As a result of these differences, the evaluation of potential human health effects associated with noncarcinogenic and carcinogenic chemicals is conducted separately. As summarized in IRIS (USEPA 1999b) and HEAST (USEPA 1997b), USEPA has developed reference doses to evaluate noncancer effects and slope factors to evaluate carcinogenic effects. If a chemical is considered to cause both noncancer health effects and cancer risks, both reference doses and slope factors may be listed for the chemical. Other chemicals may have only reference doses or slope factors developed, depending on the observed toxic effects.

#### 6.1.1 Reference Doses and Reference Concentrations

Noncancer health effects are evaluated using a reference dose, which is expressed in units of milligrams per kilogram body weight per day (mg/kg-day). A reference dose represents a USEPA-developed, estimated

daily exposure level (dose) to which humans may be exposed for a portion of their lifetime (in the case of subchronic reference doses) or for their entire lifetime (in the case of chronic reference doses), without expectation of adverse health effects. USEPA assumes the existence of a threshold concentration for noncancer effects. Below this concentration toxic effects are not expected to occur (USEPA 1989).

Reference doses are often based on animal laboratory studies, from which data are then extrapolated to a chemical concentration considered "safe" for humans. The threshold of observed effects in test animals is divided by uncertainty factors (UFs). Separate uncertainty factors, each of which may be up to 10, are used to account for each of the following:

- Protection of sensitive individuals within the receptor population.
- Extrapolation of toxicity data from animals to humans.
- Extrapolation of subchronic toxicity data to chronic exposure durations. •
- Extrapolation from a lowest-observed adverse effect level (LOAEL) to a no-observed adverse effect level (NOAEL) to assess toxicity.

The uncertainty factors for a given chemical are then multiplied together to provide a total uncertainty factor, which is then used to derive a chronic reference dose. In order to derive a reference dose protective of the most sensitive members of the human population, the uncertainty factor may range from one to 10,000. The higher the total uncertainty factor, the more uncertainty and degree of conservativeness there are in the resultant chronic reference dose.

The chronic reference dose is the USEPA-established dose used to evaluate health effects associated with long-term (chronic) exposures of at least seven years (USEPA 1989). The subchronic reference dose is the dose used to evaluate health effects associated with exposures less than seven years (USEPA 1989).

USEPA has developed route-specific reference doses for the oral and inhalation routes of exposure. However, USEPA has not developed reference doses to specifically evaluate possible impacts from dermal (skin) exposure. For this reason, oral reference doses are typically used to estimate possible noncancer health effects from dermal exposure consistent with USEPA (1989) guidance.

USEPA defines a reference concentration as an estimate of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be at appreciable risk of deleterious effects during a lifetime (USEPA 2009). The reference concentration is derived after a review of the health effects database for a chemical and identification of the most sensitive and relevant endpoint along with the principal study or studies demonstrating that endpoint. Uncertainty factors are used to account for uncertainties in the extrapolations from the experimental data conditions to an estimate appropriate to the exposed human scenario (USEPA 2009). The reference concentrations are derived from the following formula:

#### $RfC = NOAEL_{[HEC]} / (UF)^{1}$

Where:

RfC (mg/m<sup>3</sup>) = reference concentration  $NOAEL_{IHECI}$  (mg/m<sup>3</sup>) = The NOAEL or analogous exposure level obtained with an alternate approach, dosimetrically adjusted to an HEC UF = uncertainty factor(s) applied to account for the extrapolations required from the characteristics of the experimental regimen

#### 6.1.2 Cancer Slope Factors and Unit Risk Factors

USEPA has developed route-specific slope factors for chemicals that are known or potential human carcinogens. USEPA (1989) defines a slope factor and a unit risk factor as a plausible upper-bound estimate of the probability of a carcinogenic response in human populations per unit intake of a chemical (averaged over an expected lifetime of 70 years). Slope factors are used to estimate cancer risks and are expressed in units of risk per dose in mg/kg-day ([mg/kg-day]<sup>-1</sup>).

Most slope factors and unit risk factors are based on a continuous exposure, linear non-threshold extrapolation model (generally the linear multistage model) which is predicated on the assumption that any level of exposure to a carcinogen will result in some degree of carcinogenic risk, however minute (i.e., no threshold is assumed to exist). The extrapolation model derives a mathematical relationship between the generally high chemical doses and resulting effects measured in laboratory animals or epidemiological (human) studies, and applies that relationship to extrapolate effects for the generally lower doses that occur in the environment.

This low-dose extrapolation is generally regarded as a very conservative (health protective) approach. The resulting slope factor typically represents at least the upper 95th percentile of the measured dose-response relationship. USEPA has developed slope factors for oral and inhalation exposure routes but not for the dermal route. Therefore, oral slope factors are typically used to evaluate potential effects from dermal exposure (USEPA 1989).

#### 7.0 EXPOSURE ASSESSMENT

The exposure assessment provides a scientifically defensible basis for the identification of potentially exposed human receptors and the most likely ways they might be exposed to chemicals of concern at the site. As defined by USEPA (1989), the following four components are necessary for chemical exposure to occur:

- A chemical source and a mechanism of chemical release to the environment
- An environmental transport medium (e.g., soil) for the released chemical
- A point of contact between the contaminated medium and the receptor (i.e., the exposure point)
- An exposure route (e.g., ingesting chemically-impacted soil) at the exposure point

All four of these elements must be present for an exposure pathway to be considered complete and for chemical exposure to occur (USEPA 1989).

This HRA evaluated the potential for residential receptors to be exposed to the maximum detected concentrations of the constituents detected in the soil matrix and the perched shallow discontinuous groundwater. The maximum detected concentrations of the VOCs in the perched shallow discontinuous groundwater were used to assess potential health impacts via inhalation in the commercial scenario. The exposure point concentrations for commercial workers and construction workers were either the maximum detected concentrations or the upper confidence level (UCL), whichever value was less, pursuant to the ProUCL User's Guide (USEPA 2004), of the chemicals of concern detected at least one time in the media onsite. The upper confidence levels statistically derived using ProUCL version 5.0 used as the exposure point concentrations include: (1) 95% Student's-t UCL, (2) 95% KM (heck) UCL, (3) 95% KM (t) UCL, (4) 95% KM (Percentile Bootstrap) UCL and (5) 95% KM (BCA) UCL. The ProUCL model output is included as Appendix C.

Data collected from the soil matrix onsite and perched shallow groundwater during the various investigations were used in the risk assessment. Exposure point concentrations are presented in Table 4.

#### 7.1 Average and Reasonable Maximum Exposures

Typically two types of exposure scenarios are evaluated in a risk assessment; an average exposure scenario, and a reasonable maximum exposure (RME) scenario. The average exposure scenario represents a more typical exposure, believed to be most likely to occur, while the reasonable maximum exposure scenario represents a plausible worst case situation - one that is not very likely to occur. USEPA guidance (1989) recommends evaluating a reasonable maximum exposure scenario. The reasonable maximum exposure scenario estimates the exposure a receptor might receive using highly conservative intake assumptions (e.g., 90<sup>th</sup> or 95<sup>th</sup> percentile for most intake assumptions) and the upper confidence limit (UCL) on the mean of the chemical concentrations. It is assumed that by evaluating a reasonable maximum exposure scenario potential health risks to extremely sensitive individuals within a particular receptor population will be adequately addressed. As an added measure of conservatism, only a reasonable maximum exposure scenario was evaluated in this HRA.

The DTSC PEA and USEPA guidance contain formulae that incorporate default values which were selected to be health protective. Some of these default values, such as, the exposure frequency, exposure time and exposure duration, were modified when evaluating the commercial worker and construction worker scenarios (DTSC 2013, USEPA 2004).

#### 8.0 **RISK CHARACTERIZATION**

The risk characterization process incorporates data from the exposure and toxicity assessments. The exposure assessment information necessary to estimate risks and hazards includes the estimated chemical intakes, exposure modeling assumptions, and the exposure pathways assumed to contribute to the majority of exposure for each receptor over a given time period (USEPA 1989a). The exposure parameters for assessing the constituents detected in the soil matrix are included as Table 5.

The method by which chemicals with carcinogenic and/or noncarcinogenic effects are evaluated to determine whether they pose a risk or an adverse impact to human health is discussed below, relative to the exposure pathways by which the receptors may be exposed to the exposure point concentrations of the chemicals of concern.

#### 8.1 Ingestion and Dermal Contact Pathways

To provide an evaluation of chronic risk along the ingestion and dermal contact pathways the following equations for risk and hazard were used consistent with PEA guidance (DTSC 2013).

 $Hazard_{soil} =$ 

 $(1/RfD_o) \ge C_s \ge \frac{IR \ge EF \ge D \ge 10^{-6} \text{ kg/mg}}{BW \ge AT \ge 250 \text{ days/year}}$ 

+ (1/RfD<sub>o</sub>) x C<sub>s</sub> x <u>SA x AF x ABS x EF x ED x 10<sup>-6</sup> kg/mg</u> BW x AT x EF

Where:  $SF_o = oral cancer slope factor (mg/kg-day)^{-1}$   $C_s = concentration in soil (mg/kg)$   $RfD_o = oral reference dose (mg/kg-day)$  ABS = absorption fraction (dimensionless):Exposure Duration (ED) - years Exposure Frequency (EF) - days/year

Body Weight (BW) - kg Incidental Soil Ingestion Rate (IR<sub>s</sub>) - mg/day Exposed Skin (SA) -  $cm^2$ Soil to Skin Adherence Factor (AF) – mg/cm<sup>2</sup> Averaging Time (AT) - years Chemical specific values for the absorption fractions (ABS) parameter were obtained from USEPA and DTSC (USEPA, June 2015; DTSC 2013). Toxicity and exposure point concentrations are found in Table 4. Exposure parameters for assessing constituents detected in the soil matrix are presented in Table 5. The maximum concentrations of the constituents detected in the soil matrix and perched shallow discontinuous groundwater were evaluated in this risk assessment for the residential scenario. The maximum concentrations of the VOCs detected in the perched shallow discontinuous groundwater were evaluated in the perched shallow discontinuous groundwater were evaluated in the perched shallow discontinuous groundwater were evaluated in the soil matrix assessment for the commercial scenario. The maximum concentration or the upper confidence level, whichever was less, of the constituents detected in the soil matrix were evaluated in this risk assessment for the commercial worker and construction worker scenarios.

The exposure factors presented in Tables 4 and 5 provide a conservative estimate of chronic risk and hazard to human health due to exposure to the chemicals of concern detected in the soil matrix via the ingestion and dermal contact routes of exposure. The calculated estimates of risk and hazard due to exposure to constituents detected in the soil matrix are provided in Tables 6-10.

#### 8.2 Inhalation Pathway Soil Matrix

To provide an evaluation of chronic risk along the inhalation pathway the following equations (DTSC 2013, USEPA 2009) for estimating risk and hazard due to exposure to constituents of concern detected in the soil matrix were used consistent with PEA guidance (DTSC 2013, USEPA 2009).

Semi-volatile organic compounds and metals in soil are evaluated in outdoor air using particulate emission factors (PEFs) to obtain concentrations of chemicals in dust. PEFs are used to develop an estimate of the concentration of a chemical in dust based on its concentration in soil. It assumes that the dust from the site is caused by the wind and not created by mechanical means (e.g. construction activities, tilling, automobile traffic, etc.) (DTSC 2013).

A default PEF of  $1.32E+09 \text{ (m}^3/\text{kg})$  is used, because this is the same default value used by the USEPA in their Soil Screening Guidance (USEPA 2009). It assumes an infinite source of chemicals, a vegetative cover of 50%, and a mean annual wind speed of 4.69 m/s. This is equivalent to a dust concentration of 0.76 g/m<sup>3</sup> at the receptor. The default dispersion term (Q/C) of 90.80 (g/m2-s per kg/m3) is based on a site of 0.5 acres and dispersion modeling runs of 29 sites across the United States. The default Q/C provides a conservative estimate of the long-term exposure to dust (DTSC 2013).

 $C_a = (C_s/PEF) \times 1000 \mu g/mg$ 

Where:

 $C_a$  = concentration in air, mg/m<sup>3</sup>  $C_s$  = concentration in soil, mg/kg PEF = 1.32E09 (default value)

Chronic and SubChronic Exposure

$$EC = CA \times [(ET \times EF \times ED)/AT]$$

Where:

EC = exposure concentration (mg/m<sup>3</sup>)CA = contaminant concentration in air (mg/m<sup>3</sup>) ET = exposure time EF = exposure frequency ED = exposure duration AT = averaging time (varies by receptor and for noncarcinogens and carcinogens)

#### $Risk = EC \times IUR$

Where:

Risk = estimated risk EC = exposure concentration  $(\mu g/m^3)$ IUR = inhalation unit risk factor  $(\mu g/m^3)^{-1}$ 

HQ = EC/Toxicity value

Where:

HQ = hazard quotient EC = exposure concentration (mg/m<sup>3</sup>) Toxicity value = inhalation reference concentration (mg/m<sup>3</sup>)

The risk and hazard for the air pathway are based on either the exposure to volatile emissions for VOCs or the exposure to fugitive dust emissions for non-VOCs. The Office of Scientific Affairs defines a VOC as a chemical with a vapor pressure of 0.001 mm mercury or higher and a Henry's Law Constant of  $1 \times 10^{-5}$  or higher. Exposure to a chemical via the air pathway can be adequately performed using either volatilization or fugitive dust scenarios; it is not necessary to do both (DTSC 2013).

For this risk assessment exposure to non-VOCs detected in the soil matrix via the inhalation pathway was performed using the fugitive dust scenario.

As the exposure duration was 1 year for construction workers the subchronic exposure was estimated instead of acute exposure, pursuant to USEPA guidance (USEPA 2009). The commercial worker and residential receptors were assessed for chronic exposure.

## 8.3 The DTSC modified Johnson and Ettinger Model – Groundwater screen, version 3.0 (April 2003; modified by DTSC HERO December 2014)

The maximum detected concentrations of the VOCs: benzene, toluene, ethylbenzene, total xylenes, 1,2,4trimethylbenzene and 1,3,5-trimethylbenzene detected in the perched shallow (8-feet bgs) discontinuous groundwater was assessed by the DTSC modified Johnson & Ettinger Model groundwater screen, version 3.0 (April 2003; modified by DTSC HERO December 2014) for the residential and commercial scenarios.

The Johnson and Ettinger Model has the following conservative assumptions: (1) steady state conditions exist, (2) an infinite source of contamination exists, (3) the subsurface is homogenous, (4) air mixing within the building is uniform, (5) preferential pathways do not exist, (6) biodegradation of vapors does not occur, (7) contaminants are homogenously distributed, (8) contaminant vapors enter the building primarily through cracks in the foundation and walls, (9) buildings are constructed on slabs or with basements, (10)

ventilation rates and pressure differences are assumed to remain constant and (11) the receptors are exposed to these constituents for 350 days per year for 30 years (residential scenario) or 250 days per year for 25 years (commercial scenario).

The Johnson & Ettinger Model was used to calculate incremental risks and hazards by the following equations imbedded within the model:

$$Risk = \frac{URF \ x \ EF \ x \ ED \ x \ C_{building}}{AT_c \ x \ 365 \ days/year}$$

Where: URF = unit risk factor  $\mu g/m^3$ ; comparable to a SF EF = exposure frequency = 350 days/year ED = exposure duration = 30 years  $C_{building}$  = vapor concentration in the building, milligrams per cubic meter (mg/m<sup>3</sup>) per  $\mu g/kg$  soil; calculated by the model AT<sub>c</sub> = averaging time for carcinogens; default value = 70

$$\label{eq:Hazard Quotient} \begin{split} \text{Hazard Quotient} = \frac{\text{EF x ED x 1/RfC x C}_{\text{building}}}{\text{AT}_{\text{nc}} \text{ x 365 days/year}} \end{split}$$

Where: RfC = Reference Concentration mg/m<sup>3</sup>; comparable to a RfD EF = exposure frequency = 350 days/year ED = exposure duration = 30 years  $C_{building}$  = vapor concentration in the building, milligrams per cubic meter (mg/m<sup>3</sup>) per µg/kg soil; calculated by the model AT<sub>nc</sub> = averaging time for noncarcinogens; default value = 25

Site specific variables input into the model include the following:

- The depth at which groundwater was detected by Hillmann Consulting after placing a PVC pipe in a shallow soil boring and waiting for at least 2 hours for groundwater to accumulate was 8-feet bgs. Consequently the depth of groundwater was changed to 244 centimeters (cm).
- The soil type in boring 7 identified by Hillmann Consulting (please see the boring logs included as Appendix D) was silty sand which equates to loamy sand in the model. Consequently the soil type was changed to reflect loamy sand, SL.
- The temperature of groundwater was changed pursuant to the map in the Johnson & Ettinger User's Manual (page 46) to reflect Southern California temperatures of 62°F or 17°C.

The results of the Johnson & Ettinger model for the residential scenario are presented below and in Appendix E. The estimated risk  $1.4 \times 10^{-6}$  is slightly greater than the threshold  $1 \times 10^{-6}$ . The estimated hazard of 0.08 is less than the threshold of 1; indicating the VOCs detected in the perched shallow discontinuous groundwater underlying the site do not pose an adverse impact to future hotel occupants.

	Groundwater concentration µg/L	Indoor Air Concentration µg/m <sup>3</sup>	Estimated Risk	Estimated Hazard
Benzene	9.8	1.4E-01	1.4E-06	4.5E-02
Toluene	57	4.2E+00	NA	1.3E-02
Ethylbenzene	6.2	8.7E-02	7.7E-08	8.3E-05
m-Xylene	44	5.6E-01	NA	5.4E-03
o-Xylene	18	1.7E-01	NA	1.7E-03
p-Xylene	44	5.4E-01	NA	5.2E-03
1,2,4-TMB	8.1	7.6E-02	NA	1.0E-02
1,3,5-TMB	5.1	6.5E-02	NA	1.8E-03

#### **RESIDENTIAL SCENARIO**

The results of the Johnson & Ettinger model for the commercial scenario are presented below and in Appendix F. The estimated risk  $1.8 \times 10^{-7}$  is less than the threshold  $1 \times 10^{-5}$ . The estimated hazard of 0.009 is less than the threshold of 1; indicating the VOCs detected in the perched shallow discontinuous groundwater underlying the site do not pose an adverse impact to future hotel occupants, commercial workers or construction workers.

	COMMERCIAL SCENARIO							
	Groundwater concentration µg/L	Indoor Air Concentration μg/m <sup>3</sup>	Estimated Risk	Estimated Hazard				
Benzene	9.8	7.0E-02	1.7E-07	5.3E-03				
Toluene	57	4.0E-01	NA	3.1E-04				
Ethylbenzene	6.2	4.3E-02	8.8E-09	9.9E-06				
m-Xylene	44	2.8E-01	NA	6.4E-04				
o-Xylene	18	8.6E-02	NA	2.0E-04				
p-Xylene	44	2.7E-01	NA	6.2E-04				
1,2,4-TMB	8.1	3.8E-02	NA	1.2E-03				
1,3,5-TMB	5.1	3.3E-02	NA	2.1E-04				

#### MMEDCIAL SCENADIO

#### 8.4 **DTSC's LeadSpread 8.0 Model**

DTSC's LeadSpread 8.0 Model estimates the hazard due to exposure to lead in air and onsite soils/dust for adults and children within a residential exposure scenario. Typically, lead concentrations in air are not measured onsite. Therefore the model extrapolates these concentrations from the measured concentrations of lead in onsite soils.

DTSC's LeadSpread 8.0 Model results indicate that lead does not pose an unacceptable hazard to adults or children exposed to the maximum detected concentration of lead in site soils, 11mg/kg, used in the model as the exposure point concentration. These results are provided in Table 11.

#### 8.5 Noncancer Adverse Health Effects

Noncarcinogenic effects or hazards are typically evaluated by comparing an exposure level over a specified time period (e.g., a lifetime or 25 years), with a reference dose based on a similar time period.

Hazard quotient values less than 1 indicate that potential exposures to noncarcinogenic COCs are not expected to result in toxicity (USEPA 1989). Summing the hazard quotient values to derive a hazard index (HI) provides an estimation of the total potential hazard due to a simultaneous exposure to all the noncarcinogenic COCs. However, summing hazard quotient values is not necessary when the chemicals of concern target different organs within the body (USEPA 1989, DTSC 2013). Although the noncarcinogenic chemicals of concern quantitatively assessed in this risk assessment target different organs within the body, the estimated hazard quotients were summed to derive a HI.

#### 8.6 Lifetime Excess Cancer Risk

Slope factors are used to estimate the potential risk associated with exposure to individual COCs. The slope factor is multiplied by the chronic daily intake averaged over 70 years to estimate lifetime excess cancer risk. "excess" or "incremental" cancer risk represents the probability of an individual developing cancer over a lifetime as a result of chemical exposure, over and above the baseline or "background" cancer risk in the general population. Cancer risks and noncancer health hazards estimated in the HRA are regarded as estimated or theoretical results developed on the basis of the toxicity factors, chemical fate and transport, exposure assumption, and other inputs previously described. Cancer risks do not represent actual cancer cases in actual people. Rather, risks are calculated on the basis of an entirely hypothetical set of conditions. This assumed "exposure scenario" is developed to protect human health, and is based on standard USEPA and Cal-EPA methods and assumptions.

USEPA characterizes theoretical excess lifetime cancer risks below one in one million  $(10^{-6})$  as not of concern and has stated that risks between  $10^{-6}$  and one in 10,000  $(10^{-4})$  are "safe and protective of public health" (Federal Register 56(20):3535, 1991). Remedial action is not generally required by USEPA for sites with a theoretical lifetime excess risk of less than  $10^{-4}$ .

The more stringent target risk of  $10^{-6}$  is typically applied to residential receptors. To provide perspective, a total theoretical lifetime excess cancer risk of one in 100,000 ( $10^{-5}$ ) is frequently accepted by Cal-EPA for worker receptors at California sites, and the target risk for chemicals evaluated under State Proposition 65 regulations is  $10^{-5}$  (22CCR 12703).

#### 8.7 Multipathway Cancer Risk

Based on regulatory guidelines, it is appropriate to combine risk estimates across exposure pathways for a given receptor. At the same time, exposure to multiple carcinogenic COCs is also typically considered to be additive. For exposures to multiple pathways and chemicals, the following equation was used to estimate total theoretical lifetime excess carcinogenic risks:

$$\begin{array}{rcl} Total \ Risk & = & \begin{array}{ccc} m & n \\ \Sigma & \Sigma & CR_{i,p} \\ p=1 & i=1 \end{array}$$
  
Where:  
Total Risk & = & Excess cancer risk from exposure to n chemicals via m pathways

m	=	Number of exposure pathways
n	=	Number of chemicals
CR i,p	=	Potential cancer risk from exposure to chemical i via pathway p

This equation was used to estimate the total potential cancer risks due to exposure to the carcinogenic COCs via the ingestion, dermal contact and inhalation routes of exposure. The estimated risks, total risk, estimated hazards and hazard index are presented in Table 10.

#### 8.8 Estimation of Risks and Hazards

A total of 21 chemicals of concern were quantitatively assessed in the risk assessment. These chemicals of concern include: C18-C28, C28-C36, C36-C40, benzene, toluene, ethylbenzene, m,p-xylenes, o-xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, barium, cadmium, chromium, hexavalent chromium (by estimating the detected concentration pursuant to regulatory guidelines, 1/6 the detected concentration of total chromium), cobalt, copper, lead, nickel, vanadium, and zinc.

#### **Residential Scenario Child – Soil Matrix**

*Estimated Risk Inhalation* - The estimated risk due to exposure to constituents detected in the soil matrix via the inhalation exposure route is  $2.26 \times 10^{-7}$  less than the target threshold  $1 \times 10^{-6}$ .

*Hazard Quotients Ingestion and Dermal Contact* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the ingestion and dermal contact exposure routes is 1.6, which is greater than 1, the target hazard value.

*Hazard Quotients Inhalation* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the inhalation exposure route is 0.006, which is less than 1, the target hazard value.

*Summed Risk* - The total risk, summed across all exposure pathways for all carcinogenic chemicals of concern in the soil matrix, is  $2.26 \times 10^{-7}$ , less than the target risk.

Hazard Index – The total hazard, summed across all exposure pathways for all noncarcinogenic chemicals of concern in the soil matrix is 1.6, greater than the target hazard value. These estimated risk and hazards values are presented in Table 6.

#### **Residential Scenario Adult – Soil Matrix**

*Estimated Risk Inhalation* - The estimated risk due to exposure to constituents detected in the soil matrix via the inhalation exposure route is  $2.34 \times 10^{-7}$  less than the target threshold  $1 \times 10^{-6}$ .

*Hazard Quotients Ingestion and Dermal Contact* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the ingestion and dermal contact exposure routes is 0.13, which is less than 1, the target hazard value.

*Hazard Quotients Inhalation* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the inhalation exposure route is 0.006, which is less than 1, the target hazard value.

*Summed Risk* - The total risk, summed across all exposure pathways for all carcinogenic chemicals of concern in the soil matrix, is  $2.34 \times 10^{-7}$ , less than the target threshold  $1 \times 10^{-6}$ .

Hazard Index – The total hazard, summed across all exposure pathways for all noncarcinogenic chemicals of concern in the soil matrix is 0.14, less than the target hazard value. These estimated risk and hazards values are presented in Table 7.

#### **Construction Worker Scenario – Soil Matrix**

*Estimated Risk Inhalation* - The estimated risk due to exposure to constituents detected in the soil matrix via the inhalation exposure route is  $7.24 \times 10^{-8}$  less than the target threshold  $1 \times 10^{-5}$ .

*Hazard Quotients Ingestion and Dermal Contact* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the ingestion and dermal contact exposure routes is 0.01, which is less than 1, the target hazard value.

*Hazard Quotients Inhalation* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the inhalation exposure route is 0.006, which is less than 1, the target hazard value.

*Summed Risk* - The total risk, summed across all exposure pathways for all carcinogenic chemicals of concern in the soil matrix, is  $7.24 \times 10^{-8}$ , less than the target threshold  $1 \times 10^{-5}$ .

Hazard Index – The total hazard, summed across all exposure pathways for all noncarcinogenic chemicals of concern in the soil matrix is 0.023, less than the target hazard value. These estimated risk and hazards values are presented in Table 8.

#### Commercial Worker Scenario – Soil Matrix

*Estimated Risk Inhalation* - The estimated risk due to exposure to constituents detected in the soil matrix via the inhalation exposure route is  $4.31 \times 10^{-8}$  less than the target threshold  $1 \times 10^{-5}$ .

*Hazard Quotients Ingestion and Dermal Contact* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the ingestion and dermal contact exposure routes is 0.1, which is less than 1, the target hazard value.

*Hazard Quotients Inhalation* - The estimated hazard quotients due to exposure to constituents detected in the soil matrix via the inhalation exposure route is 0.001, which is less than 1, the target hazard value.

*Summed Risk* - The total risk, summed across all exposure pathways for all carcinogenic chemicals of concern in the soil matrix, is  $4.31 \times 10^{-8}$ , less than the target threshold  $1 \times 10^{-5}$ .

Hazard Index – The total hazard, summed across all exposure pathways for all noncarcinogenic chemicals of concern in the soil matrix is 0.11, less than the target hazard value. These estimated risk and hazards values are presented in Table 9.

#### 9.0 UNCERTAINTY ANALYSIS

The uncertainty analysis characterizes the propagated uncertainty in health risk assessments. These uncertainties are driven by variability in:

- The chemical data selection and assumptions used in the models with which concentrations at receptor locations were estimated.
- The variability of receptor intake parameters.
- The accuracy of toxicity values used to characterize exposure, hazards and cancer risks.

Additionally, uncertainties are introduced in the risk assessment when exposures to several substances across multiple pathways are summed.

Quantifying uncertainty is an essential element of the risk assessment process. According to USEPA's Guidance on Risk Characterization for Risk Managers and Risk Assessors, point estimates of risk "do not fully convey the range of information considered and used in developing the assessment" (USEPA 1992). The following components of the risk assessment process can introduce uncertainties:

- Data Collection and Evaluation
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization

#### 9.1 Data Collection and Evaluation

The techniques used for data sampling and analysis and the methods used for identifying chemicals for evaluation in this risk assessment, may result in a number of uncertainties. These uncertainties are itemized below in the form of assumptions.

- It was assumed that the nature and extent of chemical impacts on and near the site have been adequately characterized. If this assumption is not valid, then potential health impacts may be over- or underestimated.
- Systematic or random errors in the chemical analyses may yield erroneous data. These types of errors may result in a slight over- or underestimation of risk.

#### 9.2 Exposure Assessment

A number of uncertainties are associated with the exposure assessment, including estimation of exposure point concentrations and assumptions used to estimate chemical intakes. Key uncertainties associated with these components of the HRA are summarized below.

#### 9.2.1 Exposure Pathways

The exposure pathways evaluated in this HRA are expected to represent the primary pathways of exposure, based on the results of the chemical analyses, and the expected fate and transport of these chemicals in the environment. Minor or secondary pathways may also exist, but often cannot be identified or evaluated using the available data. The contribution of secondary pathways to the overall risk from the site is not

likely to be significant. In addition, intake assumptions are reflective of trends (usually for the most sensitive individual within an entire population), and as such are subject to intrinsic variability. In both cases, their presence introduces a level of uncertainty to this risk assessment process.

#### 9.3 Toxicity Assessment

Toxicity information for many chemicals is often limited. Consequently, there are varying degrees of uncertainty with the calculated toxicity values. Sources of uncertainty associated with toxicity values include:

- Using dose-response information from effects observed at high doses to predict the adverse health effects that may occur following exposure to the low levels expected from human contact with the agent in the environment.
- Using dose-response information from short-term exposures to predict the effects of long-term exposures.
- Using dose-response information from animal studies to predict effects in humans.
- Using dose-response information from homogeneous animal populations or human populations to predict the effects likely to be observed in the general population consisting of individuals with a wide range of sensitivities.

To compensate for these uncertainties, USEPA typically applies a margin of safety when promulgating human toxicity values. Therefore, use of USEPA toxicity values likely results in an overestimation of potential hazard and risk.

#### 9.4 Risk Characterization

The reasonable maximum exposure scenario risk characterization represents an over-estimation of risk. Site-specific information regarding depth below ground at which the constituents of concern were detected was not used in the equations. The reasonable maximum exposure scenario estimated the risk to the receptors based on the maximum detected concentrations or the UCLs for the constituents quantitatively assessed in this risk assessment.

#### 9.5 Summary of Risk Assessment Uncertainties

The analysis of the uncertainties associated with this risk assessment indicates that the estimated risks and hazards derived from the equations in the PEA Manual (DTSC 2013), the RAGs Manual (USEPA 2009), the LeadSpread Model (DTSC) and the J&E Model for the reasonable maximum exposure scenario represent an over-estimation of risk. Although as outlined in the sections above, many factors can contribute to the over- or underestimation of risk, in general, a mixture of conservative and upper-bound input values were identified to estimate potential exposures. Compounding conservative and upper-bound input values in the risk assessment process are intended to lead to reasonable, maximum, health-conservative estimates. The actual impacts to human health are most likely less than those estimated in this HRA for the evaluated receptors and pathways.

#### 10.0 REFERENCES

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# TABLES

SAMPLE	DATE	C8-C10	C10-C18	C18-C28	C28-C36	C36-C40
ID	SAMPLED	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB1-2	1/3/07	<10	<10	15	17	16
SB1-6	1/3/07	<10	<10	12	14	15
SB1-10	1/3/07	<10	<10	<10	<10	<10
SB2-4	1/3/07	<10	<10	13	15	16
SB2-8	1/3/07	<10	<10	<10	<10	<10
SB3-2	1/3/07	<10	<10	20	35	45
SB3-5	1/3/07	<10	<10	<10	<10	<10
SB4-4	1/3/07	<10	<10	19	45	26
SB4-8	1/3/07	<10	<10	<10	<10	<10
SB4-10	1/3/07	<10	<10	<10	<10	<10
SB5-2	1/3/07	<10	<10	<10	<10	<10
SB5-6	1/3/07	<10	<10	14	19	16
SB6-4	1/3/07	<10	<10	23	38	27
SB6-8	1/3/07	<10	<10	<10	<10	<10
SB6-10	1/3/07	<10	<10	11	22	18

Notes:

mg/kg = milligrams per kilogram

Analytical results are included as Appendix A SB1-2 = Soil Boring 1, 2-feet into the area of the soil stockpile

SAMPLE	DATE	As	Ba	Cd	Со	Cr	Cu	Pb	Ni	V	Zn
ID	SAMPLED	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RSLr		0.68	15000	4.6	23	120000	3100	80	820	390	23000
SB1-2	1/3/07	3.4						4.9			
SB1-6	1/3/07	<1.0						1.2			
SB1-10	1/3/07	<1.0						<1.0			
SB2-4	1/3/07	<1.0						1.1			
SB2-8	1/3/07	4.1						5.2			
SB3-2	1/3/07	<1.0						1.6			
SB3-6	1/3/07	4.8						4.9			
SB4-4	1/3/07	3.1						6.1			
SB4-8	1/3/07	3.5						3.4			
SB4-10	1/3/07	4.1						4.8			
SB5-2	1/3/07	9.8						6.1			
SB5-6	1/3/07	<1.0						1.3			
SB6-4	1/3/07	<1.0						<1.0			
SB6-8	1/3/07	<1.0						<1.0			
SB6-10	1/3/07	<1.0						<1.0			
B7-5	6/11/15	6	130	5.9	18	47	28	4.8	56	68	71
B8-5	6/11/15	9.9	110	6.2	14	38	27	7	43	65	75
B9-5	6/11/15	2.5	77	<1.0	20	45	20	2.3	50	42	39
B10-5	6/11/15	8.5	110	7.6	12	27	30	11	49	53	92
B11-5	6/11/15	3.2	78	34	2.4	2.1	5.5	1.4	8.5	12	16
B12-5	6/11/15	<1.0	57	1.8	8.3	12	12	2	15	21	17

Notes:

mg/kg = milligram per kilogram

As = arsenic, Ba = barium, Cd = cadmium, Co = cobalt, Cr = chromium, Cu = copper, Pb = lead, Ni = nickel, V = vanadium, Zn = zinc SB1-2 = Soil Boring 1, 2 feet into soil stockpile; SB1-2 through SB6-10 were collected from the area covered by the soil stockpile B7-5 = Boring 7, 5 feet below ground surface (bgs). B7-5 through B12-5 were collected from soil borings.

Analytical results are included as Appendices A & B

Only detected concentrations of metals are presented in this table. All other metals were ND.

Blank cell indicates analyte was not analyzed by laboratory.

RSLr = USEPA Regional Screening Level for residential soils (November 2015); Cd and Pb RSL values are from DTSC HHRA Note 3

SAMPLE	DATE	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	1,3,5-TMB	1,2,4-TMB
ID	SAMPLED	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
B7-W	6/12/15	9.8	57.0	6.2	44.0	18.0	5.1	8.1
B10-W	6/12/15	4.5	28.0	2.5	19.0	7.9	2.6	4.1

Notes:

ug/L = micrograms per liter

B7-W = Soil Boring 7, groundwater collected from PVC pipe placed in boring for at least 2 hours for groundwater accumulation Analytical results are included as Appendix B

Only detected concentrations of VOCs are presented in this table. All other VOCs were ND.

TMB = trimethylbenzene

## Table 4

## **Exposure Point Concentrations, Slope Factors and Reference Doses**

	Residential	Commercial				
ANALYTE	EPC	EPC	SFo	IUR	RfDo	RfCi
C18-C28	23	15			2.00E+00	
C28-C36	45	23.27			2.00E+00	
C36-C40	45	21			2.00E+00	
barium	130	116.1			2.00E-01	5.00E-04
cadmium	34	31.8		1.80E-03	1.00E-03	1.00E-05
cobalt	20	17.76			3.00E-04	6.00E-06
chromium	47	43.58			1.50E+00	
hexavalent chromium	7.83	7.26	5.00E-01	8.40E-02	3.00E-03	1.00E-04
copper	30	28.53			4.00E-02	
lead	11					
nickel	56	53.39		2.60E-04	2.00E-02	5.00E-04
vanadium	68	62.45			5.00E-03	1.00E-04
zinc	92	78.14			3.00E-01	

Notes:

EPC = Exposure Point Concentration; either the maximum detected concentration of the analyte

in the soil matrix for Residential receptors or the UCL for Commercial receptors.

UCL calculated using ProUCL version 5.0. Units are expressed in mg/kg

Lead was assessed with DTSC's LeadSpread 8.0 Model using the maximum concentration as the EPC

 $SFo = Slope Factor, oral route of exposure (mg/kg-day)^{-1}$ 

IUR = inhalation unit risk factor, inhalation route of exposure  $(\mu g/m3)^{-1}$ 

USEPA RSLs November 2015

RfDo = Reference Dose, oral route of exposure (mg/kg-day)

RfCi = Reference Concentration, inhalation route of exposure  $(mg/m^3)$ 

The SFs for nickel are from OEHHA

The RfDs and/or RfCs for barium, trivalent chromium and zinc are from USEPA IRIS

The RfCi for barium and the RfDo for copper are from Heast

The RfD for vanadium is derived by USEPA within Section 5, Regional Screening Levels (USEPA 2015)

The RfDs for TPH-g and TPH-o are from MADEP (October 2002) and DTSC (2013)

Blank cell indicates a SF or RfD are not available for the analyte

#### Table 5 - Exposure Parameters

		Receptor Populations					
Exposure Parameter	Notation	Commercial	Construction	Residentia	l User Child	Units	Reference
		Worker	Worker	Adult	Child		
General Parameters							
Body Weight	BW	70	70	70	15	kg	DTSC
Exposure Duration	ED	25	1	24	6	years	DTSC
Site Visit Duration	SVD	8	8	24	24	hours/day	
Soil Ingestion Pathway	· · ·		·		•		
Exposure Frequency	EF	250	365	350	350	days/year	
Averaging Time c 70 yrs x 365 days	ATc	25,550	25,550	25,550	25,550	days	DTSC
Averaging Time nc 6 yrs x 365 days child	ATnc	25,550	25,550	25,550	2,190	days	DTSC
Soil Ingestion Rate	IR	100	330	100	200	mg/day	DTSC
Dermal Contact with Soil				T	1		
Averaging Time c 70 yrs x 365 days	ATc	25,550	25,550	25,550	25,550	days	DTSC
Averaging Time nc 6 yrs x 365 days child	ATnc	25,550	25,550	25,550	2,190	days	DTSC
Skin Surface Area	SA	3,300	3,300	5,700	2,900	cm <sup>2</sup> /event	OEHHA
Soil-to-Skin Adherence factor	AF	0.2	0.2	0.07	0.21	mg/cm <sup>2</sup>	OEHHA
Fraction of Chemical Dermally Absorbed	ABS	chem specific	chem specific	ch sp	ch sp	unitless	DTSC
Inhalation of Outdoor Air	1 1			1			
Exposure Frequency	EF	250	365	350	350	days/year	
Averaging Time 365 d/yr x 70 yr x 24 hr/d	Atc	613,200	613,200	613,200	613,200	hours	DTSC
Averaging Time 365 d/yr x 6 yr x 24 hr/d child	Atnc	613,200	613,200	613,200	52,560	hours	DTSC

Notes:

ABS = 0.1 for VOCs, 0.13 for naphthalene, 0.01 for most metals (DTSC 2013; USEPA RSL November 2015)

Table 6
Estimated Risks and Hazards SOIL - Residential Child Scenario

ANALYTE	RISKo	RISKi	HAZARDo	HAZARDi
C18-C28			1.92E-04	
C28-C36			3.75E-04	
C36-C40			3.75E-04	
barium			8.56E-03	1.89E-04
cadmium		1.05E-08	4.36E-01	2.47E-03
chromium			4.15E-04	
chromium 6		2.05E-07		5.69E-05
cobalt			8.78E-01	2.42E-03
copper			9.88E-03	
nickel		1.05E-08	3.69E-02	4.52E-04
vanadium			1.79E-01	4.94E-04
zinc			3.64E-03	
SUM RISK		2.26E-07		
SUM HAZARD			1.55E+00	6.08E-03
HAZARD INDEX = 1.6				
SUM RISK = 2.26E-07				

Table 7
Estimated Risks and Hazards SOIL - Residential Adult Scenario

ANALYTE	RISKo	RISKi	HAZARDo	HAZARDi
C18-C28			1.76E-05	
C28-C36			3.45E-05	
C36-C40			3.45E-05	
barium			7.41E-04	1.89E-04
cadmium		1.91E-08	3.74E-02	2.47E-03
chromium			3.59E-05	
chromium 6		2.05E-07		5.69E-05
cobalt			7.60E-02	2.42E-03
copper			8.55E-04	
nickel		1.05E-08	3.19E-03	5.49E-04
vanadium			1.55E-02	2.03E-04
zinc			3.15E-04	
SUM RISK		2.34E-07		
SUM HAZARD			1.34E-01	5.89E-03
HAZARD INDEX = 0.14				
SUM RISK = 2.34E-07				

# Table 8 Estimated Risks and Hazards SOIL - Construction Worker Scenario

ANALYTE	RISKo	RISKi	HAZARDo	HAZARDi
C18-C28			1.41E-06	
C28-C36			2.19E-06	
C36-C40			1.96E-06	
barium			9.30E-05	1.76E-04
cadmium		5.94E-09	5.01E-03	2.41E-03
chromium			4.68E-06	
chromium 6		6.33E-08		5.50E-05
cobalt			9.49E-03	2.24E-03
copper			1.14E-04	
nickel		3.13E-09	4.28E-04	4.49E-04
vanadium			2.00E-03	4.73E-04
zinc			3.76E-05	
SUM RISK	-	7.24E-08		
SUM HAZARD			1.72E-02	5.80E-03
HAZARD INDEX = 0.023				
SUM RISK = 7.24E-08				

# Table 9 Estimated Risks and Hazards SOIL - Commercial Worker Scenario

ANALYTE	RISKo	RISKi	HAZARDo	HAZARDi
C18-C28			4.06E-03	
C28-C36			7.87E-03	
C36-C40			1.41E-05	
barium			5.05E-04	3.35E-05
cadmium		3.54E-09	2.61E-02	4.58E-04
chromium			2.54E-05	
chromium 6		3.77E-08		1.05E-05
cobalt			5.15E-02	4.27E-04
copper			6.20E-04	
nickel		1.86E-09	2.32E-03	1.00E-04
vanadium			1.09E-02	1.13E-04
zinc			2.04E-04	
SUM RISK		4.31E-08		
SUM HAZARD			1.04E-01	1.14E-03
HAZARD INDEX = 0.11				
SUM RISK = 4.31E-08				

## Table 10 - Summary of Risks and HazardsSOIL and GROUNDWATER

		Receptor Populations		
			Resi	dential
	Commercial Worker	Construction Worker	Adult	Child
		- 1		-
Hazard Index	0.12	0.023	0.22	1.6
$\sum$ Risk	2.22E-07	7.24E-08	1.70E-06	1.70E-06

Notes:

Hazard Index = J&E model results + estimated risks due to ingestion, dermal contact and inhalation of constituents in soil for Commercial Worker and Residential Adult and Child receptors

 $\Sigma$ Risk Residential = J&E model results + estimated risks due to inhalation of constituents adhered to soil for Commercial Worker and Residential Adult and Child receptors

#### LEAD RISK ASSESSMENT SPREADSHEET 8 CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

#### Click here for ABBREVIATED INSTRUCTIONS FOR LEADSPREAD 8

INPUT	
MEDIUM	LEVEL
Lead in Soil/Dust (ug/g)	11.0
Respirable Dust (ug/m <sup>3</sup> )	1.5

	OUTP	UT				
Percentile Estimate of Blood Pb (ug/dl)						
	50th	90th	95th	98th	99th	(ug/g)
BLOOD Pb, CHILD	0.1	0.1	0.2	0.2	0.2	77
BLOOD Pb, PICA CHILD	0.2	0.3	0.3	0.4	0.5	39

EXPOSURE PAR	AMETERS				
	units	children			
Days per week	days/wk	7			
Geometric Standard Deviation		1.6			
Blood lead level of concern (ug/dl)		1			
Skin area, residential	cm <sup>2</sup>	2900			
Soil adherence	ug/cm <sup>2</sup>	200			
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001			
Soil ingestion	mg/day	100			
Soil ingestion, pica	mg/day	200			
Ingestion constant	(ug/dl)/(ug/day)	0.16			
Bioavailability	unitless	0.44			
Breathing rate	m³/day	6.8			
Inhalation constant	(ug/dl)/(ug/day)	0.192			

PATHWAYS								
CHILDREN		typica	I		with pi	ca		
	Pathwa	ay cont	ribution	Pathwa	ay cont	ribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent		
Soil Contact	5.8E-5	0.00	1%		0.00	0%		
Soil Ingestion	7.0E-3	0.08	99%	1.4E-2	0.15	100%		
Inhalation	2.0E-6	0.00	0%		0.00	0%		

Click here for REFERENCES

#### MODIFIED VERSION OF USEPA ADULT LEAD MODEL

### CALCULATIONS OF BLOOD LEAD CONCENTRATIONS (PbBs) AND PRELMIINARY REMEDIATION GOAL (PRG)

#### EDIT RED CELL

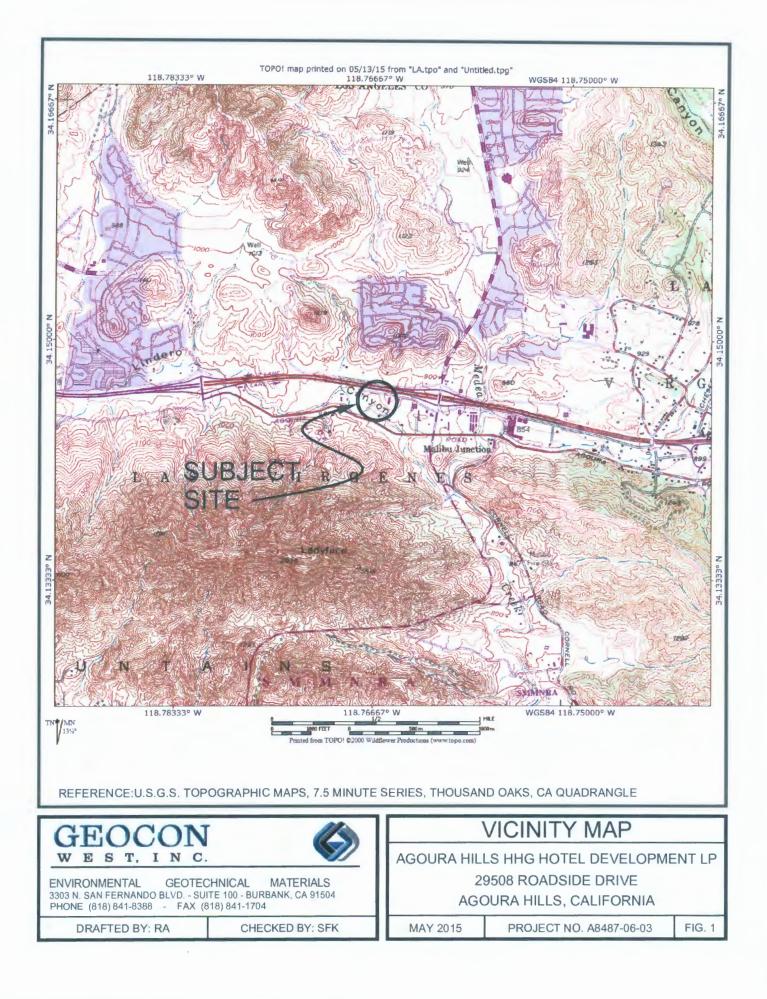
Variable	Description of Variable	Units	
PbS	Soil lead concentration	ug/g or ppm	11
R <sub>fetal/maternal</sub>	Fetal/maternal PbB ratio		0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD <sub>i</sub>	Geometric standard deviation PbB		1.8
PbB <sub>0</sub>	Baseline PbB	ug/dL	0.0
IR <sub>s</sub>	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
AF <sub>S, D</sub>	Absorption fraction (same for soil and dust)		0.12
EF <sub>S, D</sub>	Exposure frequency (same for soil and dust)	days/yr	250
AT <sub>S, D</sub>	Averaging time (same for soil and dust)	days/yr	365
PbB <sub>adult</sub>	PbB of adult worker, geometric mean	ug/dL	0.0
PbB <sub>fetal, 0.90</sub>	90th percentile PbB among fetuses of adult workers	ug/dL	0.0
PbBt	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	1.0
P(PbB <sub>fetal</sub> > PbB <sub>t</sub> )	Probability that fetal PbB > PbB <sub>t</sub> , assuming lognormal distributio	%	0.0%

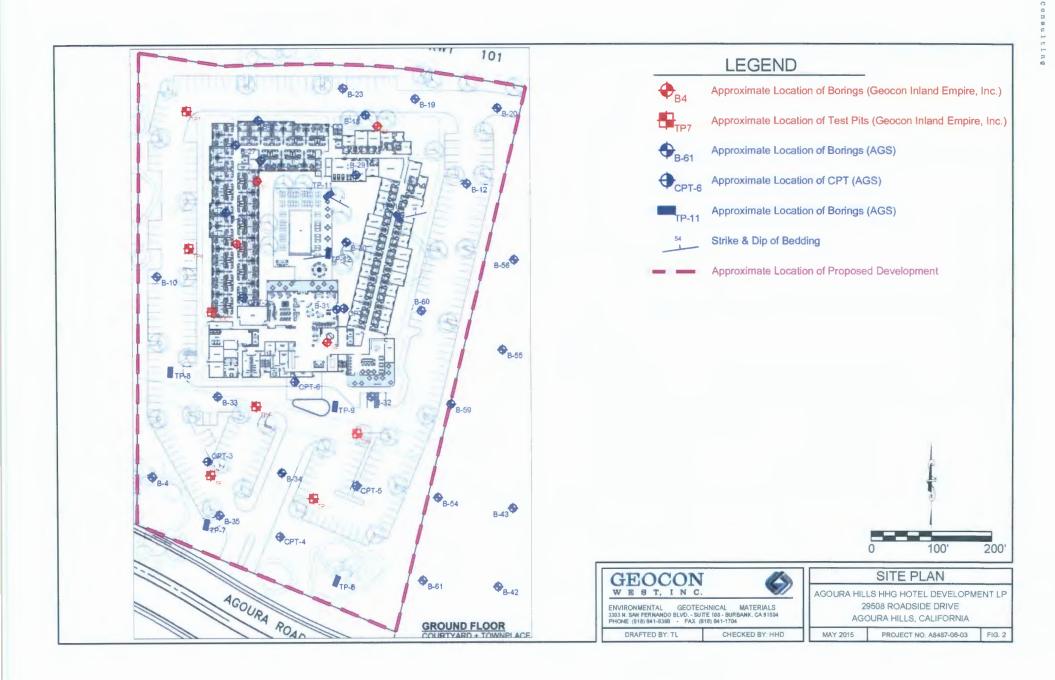
PRG90

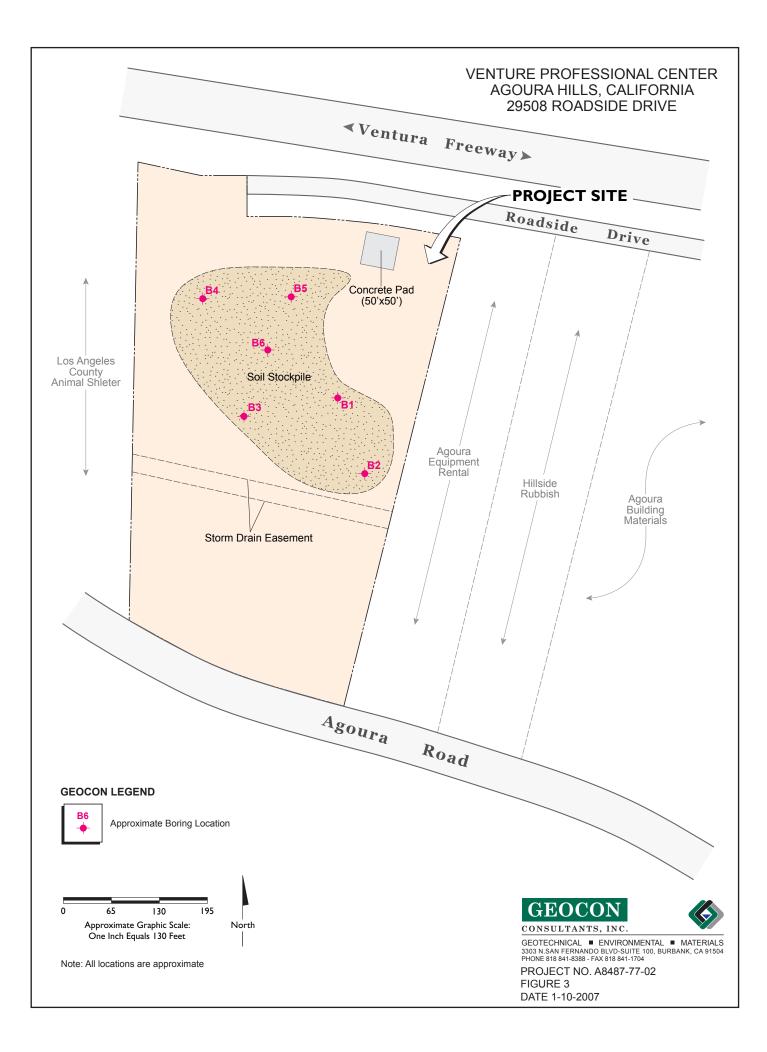
318

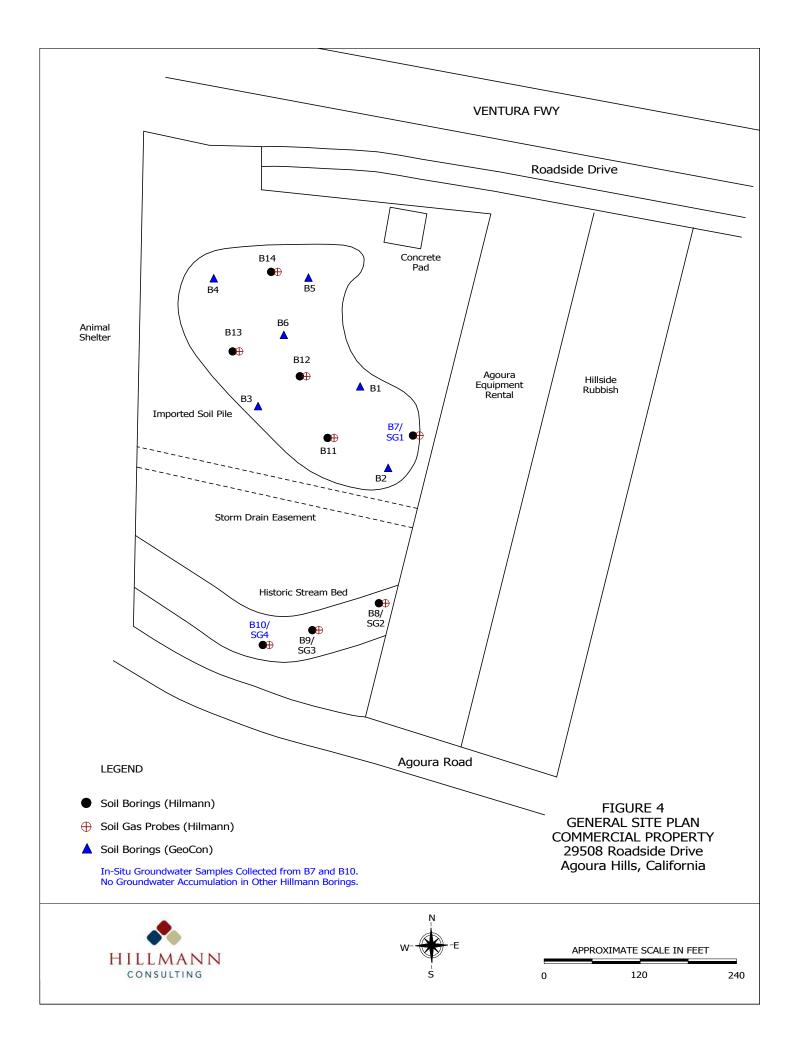
Click here for REFERENCES

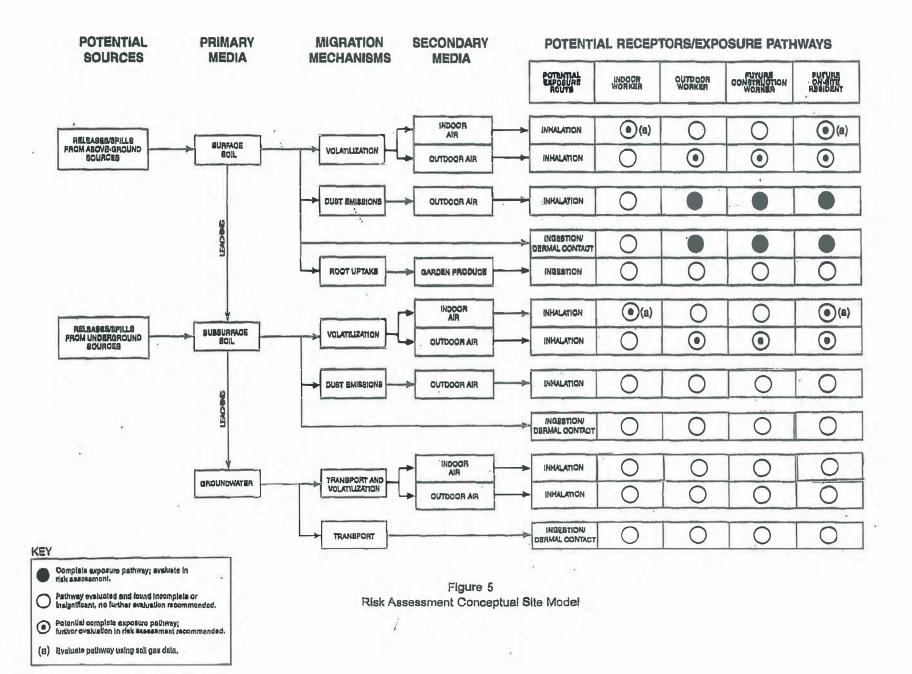
## FIGURES











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## **APPENDIX** A

### Soil Matrix Analytical Data Advanced Technology Laboratories January 2007

January 10, 2007

Mike Conkle Geocon Consultants, Inc. 3303 N. San Fernando Blvd., Suite 100 Burbank, CA 91504 TEL: (818) 841-8388 FAX: (818) 841-1704 Solution IN ACCORDANCE

ELAP No.: 1838 NELAP No.: 02107CA NEVADA.: CA-401 Arizona: AZ0689

CSDLAC No.: 10196 Workorder No.: 088870

RE: VCC, A8487-77-02

Attention: Mike Conkle

Enclosed are the results for sample(s) received on January 03, 2007 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez

Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.



CLIENT:	Geocon Cons	sultants, Inc.			Client Sampl	e ID: B1-2'			
Lab Order:	088870		Tag Number:						
Project:	VCC, A8487	-77-02			Collection 1	Date: 1/3/20	078	:50:00 AN	M
Lab ID:	088870-001A				Ma	trix: SOIL			
Analyses		Re	sult	PQL	Qual Units	Units D		Date Analyzed	
ICP METALS									
		EPA 3050B			EPA 60 <sup>-</sup>				
RunID: ICP5_	_070108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: RQ
Arsenic			3.4	1.0	mg/Kg		1		1/8/2007
Lead			4.9	1.0	mg/Kg		1		1/8/2007
HYDROCARB	BON CHAIN IDEN	TIFICATION							
		LUFT			EPA 8015	B(M)			
RunID: GC7_	070108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR
T/R Hydrocart	bons: C8-C10		ND	10	mg/Kg		1		1/8/2007
T/R Hydrocart	bons: C10-C18		ND	10	mg/Kg		1		1/8/2007
T/R Hydrocart	bons: C18-C28		15	10	mg/Kg		1		1/8/2007
T/R Hydrocart	bons: C28-C36		17	10	mg/Kg		1		1/8/2007
T/R Hydrocart	bons: C36-C40		16	10	mg/Kg		1		1/8/2007
T/R Hydrocart	bons: C8-C40 Total		48	10	mg/Kg		1		1/8/2007
ORGANOCHL	ORINE PESTICIE	DES BY GC/ECI	2						
		EPA 3550B			EPA 808	31A			
RunID: GC10	_070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007
Aldrin			ND	1.0	µg/Kg		1		1/6/2007
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007
alpha-Chlorda	ine		ND	1.0	µg/Kg		1		1/6/2007
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007
Chlordane			ND	8.5	µg/Kg		1		1/6/2007
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007
Dieldrin			ND	2.0	µg/Kg		1		1/6/2007
Endosulfan I			ND	1.0	µg/Kg		1		1/6/2007
Endosulfan II			ND	2.0	µg/Kg		1		1/6/2007
Endosulfan su	ultate		ND	2.0	µg/Kg		1		1/6/2007
Endrin			ND	2.0	µg/Kg		1		1/6/2007
Endrin aldehy			ND	2.0	µg/Kg		1		1/6/2007
Endrin ketone	1		ND	2.0	µg/Kg		1		1/6/2007
gamma-BHC	1		ND	1.0	µg/Kg		1		1/6/2007
gamma-Chlor	dane		ND	1.0	µg/Kg		1		1/6/2007
Heptachlor			ND	1.0	µg/Kg		1		1/6/2007
Heptachlor ep	oxide		ND	1.0	µg/Kg		1		1/6/2007
Methoxychlor			ND	8.5	µg/Kg		1		1/6/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

DO Surrogate Diluted Out

Page 1 of 30

CLIEN	T: Geocon C	Geocon Consultants, Inc. r: 088870			Client Sample ID: B1-2'			
Lab Or	rder: 088870				ng Numb	er:		
Project	ect: VCC, A8487-77-02			Collection Date: 1/3/2007 8:50:00 AM				Λ
Lab ID	088870-0	01A	Matrix: SOIL					
Analyse	es	Rest	ılt	PQL Qual	Units	DF	Date	Analyzed
ORGAN	NOCHLORINE PEST	ICIDES BY GC/ECD EPA 3550B		E	PA 8081	A		
RunID:	GC10_070105A	QC Batch:	32599		F	repDate:	1/5/2007	Analyst: VLT
- ·	hene		ND	85	µg/Kg	1		1/6/2007

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

Page 2 of 30

CLIENT:	Geocon Cons	sultants, Inc.			Client San	nple ID: B	81-6'		
Lab Order:	088870				Tag N	umber:			
Project:	VCC, A8487	-77-02			-	n Date: 1	/3/2007 9	9:00:00 AN	Ν
Lab ID:	088870-003 <i>A</i>				]	Matrix: S	OIL		
Analyses		Result		PQL Qual Units		DF	DF Date Analyze		
ICP METALS		-		·	<b>C</b>				
		EPA 3050B			EPA	6010B			
RunID: ICP5_(	070108C	QC Batch:	32629			PrepDa	ite:	1/8/2007	Analyst: <b>RQ</b>
Arsenic			ND	1.0	mg/		1		1/8/2007
Lead			1.2	1.0	mg/	-	1		1/8/2007
	ON CHAIN IDEN	TIFICATION	1.2	1.0	iiig/	Ng	1		1/0/2007
III BROCARD		LUFT			EPA 80	)15B(M)			
RunID: GC7 0	70108A	QC Batch:	32634			PrepDa	nto.	1/8/2007	Analyst: CBR
T/R Hydrocarb		QO Daton.	ND	10	-	•	1	1/0/2007	1/8/2007
,			ND	10	mg/	-	1		1/8/2007
T/R Hydrocarb T/R Hydrocarb			12	10	mg/ mg/	-	1		1/8/2007
T/R Hydrocarb			12	10	mg/	-	1		1/8/2007
T/R Hydrocarb			14	10	mg/	-	1		1/8/2007
	ons: C8-C40 Total		41	10	mg/	-	1		1/8/2007
•		DES BY GC/ECI		10	iiig/	i (g	•		1/0/2001
ONCANCONE		EPA 3550B			EPA	8081A			
RunID: GC10_	070105A	QC Batch:	32599			PrepDa	ite:	1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/l	Kg	1		1/6/2007
4,4´-DDE			ND	2.0	µg/l	Kg	1		1/6/2007
4,4´-DDT			ND	2.0	µg/l	Kg	1		1/6/2007
Aldrin			ND	1.0	µg/l	Kg	1		1/6/2007
alpha-BHC			ND	1.0	µg/		1		1/6/2007
alpha-Chlordar	ie		ND	1.0	µg/l		1		1/6/2007
beta-BHC			ND	1.0	µg/l	-	1		1/6/2007
Chlordane			ND	8.5	µg/		1		1/6/2007
delta-BHC			ND	1.0	µg/l	-	1		1/6/2007
Dieldrin			ND	2.0	µg/l		1		1/6/2007
Endosulfan I			ND	1.0	µg/l		1		1/6/2007
Endosulfan II	6-1-		ND	2.0	µg/l	-	1		1/6/2007
Endosulfan sul	lale			2.0	µg/l		1		1/6/2007
Endrin Endrin aldehvd	0		ND ND	2.0 2.0	µg/l		1 1		1/6/2007 1/6/2007
Endrin aldehyd Endrin ketone	C		ND	2.0 2.0	μg/l μg/l		1		1/6/2007
gamma-BHC			ND	2.0 1.0	µg/l	-	1		1/6/2007
gamma-Chlord	ane		ND	1.0	µg/l		1		1/6/2007
Heptachlor			ND	1.0	μg/l		1		1/6/2007
Heptachlor epo	xide		ND	1.0	μg/l	-	1		1/6/2007
Methoxychlor			ND	8.5	μg/l		1		1/6/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

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CLIENT:	Geocon Con	nsultants, Inc.		Clien	t Sample II	<b>):</b> B1-6'					
Lab Order	: 088870			Tag Number:							
Project:	VCC, A848	37-77-02		Collection Date: 1/3/2007 9:00:00 AM							
Lab ID:	Lab ID: 088870-003A				Matrix	K: SOIL					
Analyses		Resu	ılt	PQL Qua	Units	DF	Date	Analyzed			
ORGANOC	HLORINE PESTIC	IDES BY GC/ECD EPA 3550B			EPA 8081A						
RunID: GC	C10_070105A	QC Batch:	32599		Pre	epDate:	1/5/2007	Analyst: VLT			
	•		ID	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT: Lab Order: Project: Lab ID:	Geocon Con: 088870 VCC, A8487 088870-0054	7-77-02		Client Sample ID: B1-10' Tag Number: Collection Date: 1/3/2007 9:00:00 AM Matrix: SOIL							
Analyses		Re	sult	PQL	Qual Units		DF	Date Analyzed			
ICP METALS											
		EPA 3050B			EPA 601	0B					
RunID: ICP5_0	70108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: <b>RQ</b>		
Arsenic			ND	1.0	mg/Kg		1		1/8/2007		
Lead			ND	1.0	mg/Kg		1		1/8/2007		
HYDROCARBO	ON CHAIN IDEN	TIFICATION									
		LUFT			EPA 8015	B(M)					
RunID: GC7_07	70108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR		
T/R Hydrocarbo			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo			ND	10	mg/Kg		1		1/8/2007		
	ons: C8-C40 Total		ND	10	mg/Kg		1		1/8/2007		
		DES BY GC/ECI	<b>)</b>		0 0						
		EPA 3550B			EPA 808	81A					
RunID: GC10_(	070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT		
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007		
Aldrin			ND	1.0	µg/Kg		1		1/6/2007		
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007		
alpha-Chlordan	e		ND	1.0	µg/Kg		1		1/6/2007		
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Chlordane			ND	8.5	µg/Kg		1		1/6/2007		
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Dieldrin			ND	2.0	µg/Kg ₩a/Ka		1		1/6/2007		
Endosulfan I				1.0	µg/Kg ug/Kg		1 1		1/6/2007		
Endosulfan II Endosulfan sulf	ato		ND ND	2.0 2.0	μg/Kg μg/Kg		1 1		1/6/2007 1/6/2007		
Endosulian sull	αισ		ND	2.0 2.0	μg/Kg μg/Kg		י 1		1/6/2007		
Endrin aldehyde	2		ND	2.0	μg/Kg μg/Kg		י 1		1/6/2007		
Endrin ketone			ND	2.0	μg/Kg μg/Kg		1		1/6/2007		
gamma-BHC			ND	1.0	μg/Kg μg/Kg		1		1/6/2007		
gamma-Chlorda	ane		ND	1.0	μg/Kg		1		1/6/2007		
Heptachlor			ND	1.0	μg/Kg		1		1/6/2007		
Heptachlor epox	xide		ND	1.0	μg/Kg		1		1/6/2007		
Methoxychlor			ND	8.5	μg/Kg		1		1/6/2007		

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

ND Not Detected at the Reporting Limit

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

Results are wet unless otherwise specified

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CLIENT:	Geocon Con	sultants, Inc.		Client Sample ID: B1-10'							
Lab Order:	088870			Tag Number:							
Project:	VCC, A848'	7-77-02		Collection Date: 1/3/2007 9:00:00 AM							
Lab ID:			Matri	ix: SOIL							
Analyses		Resu	lt PQ	L Qual	Units	DF	Date	Analyzed			
ORGANOCHL	ORINE PESTICI	DES BY GC/ECD EPA 3550B		E	PA 8081	A					
RunID: GC10	_070105A	QC Batch:	32599		Р	repDate:	1/5/2007	Analyst: VLT			
			D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Cons	sultants, Inc.			Client Sam	ple ID: E	32-4'		
Lab Order:	088870				Tag N	umber:			
Project:	VCC, A8487	-77-02			-		/3/2007 9	9:45:00 AN	N
Lab ID:	088870-007 <i>A</i>				Γ	Matrix: S	OIL		
Analyses		Result		PQL Qual Units		DF	DF Date Analy		
ICP METALS		-		t	•				<b>.</b>
		EPA 3050B			EPA 6	6010B			
RunID: ICP5_(	070108C	QC Batch:	32629			PrepDa	ate:	1/8/2007	Analyst: <b>RQ</b>
Arsenic			ND	1.0	mg/		1		1/8/2007
Lead			1.1	1.0	mg/	-	1		1/8/2007
	ON CHAIN IDEN	TIFICATION	1.1	1.0	iiig/	Ng	1		1/0/2007
III BROCARD		LUFT			EPA 80	15B(M)			
RunID: GC7 0	70108A	QC Batch:	32634			PrepDa	ato.	1/8/2007	Analyst: CBR
T/R Hydrocarbo		QO Daton.	ND	10	~~~/	•	1	1/0/2007	1/8/2007
T/R Hydrocarbo			ND	10	mg/ mg/	-	1		1/8/2007
T/R Hydrocarbo			13	10	mg/	-	1		1/8/2007
T/R Hydrocarbo			15	10	mg/	-	1		1/8/2007
T/R Hydrocarbo			16	10	mg/	-	1		1/8/2007
	ons: C8-C40 Total		44	10	mg/	-	1		1/8/2007
•		ES BY GC/ECI		10	ing,		•		1/0/2001
ONCANCOLL		EPA 3550B			EPA 8	3081A			
RunID: GC10_	070105A	QC Batch:	32599			PrepDa	ate:	1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/ł	٢g	1		1/6/2007
4,4´-DDE			ND	2.0	µg/ł	٢g	1		1/6/2007
4,4´-DDT			ND	2.0	µg/ł	٢g	1		1/6/2007
Aldrin			ND	1.0	µg/ł	٢g	1		1/6/2007
alpha-BHC			ND	1.0	µg/ł		1		1/6/2007
alpha-Chlordar	ie		ND	1.0	µg/ŀ		1		1/6/2007
beta-BHC			ND	1.0	µg/ł	-	1		1/6/2007
Chlordane			ND	8.5	µg/ł		1		1/6/2007
delta-BHC			ND	1.0	µg/ł	-	1		1/6/2007
Dieldrin			ND	2.0	µg/ł		1		1/6/2007
Endosulfan I			ND	1.0	µg/ł		1		1/6/2007
Endosulfan II	6-1-		ND	2.0	µg/ł	-	1		1/6/2007
Endosulfan sul	lale			2.0	µg/ł		1		1/6/2007
Endrin Endrin aldebyd	0		ND ND	2.0 2.0	µg/ł		1 1		1/6/2007 1/6/2007
Endrin aldehyd Endrin ketone	C		ND ND	2.0 2.0	µg/ł		1		1/6/2007
gamma-BHC			ND	2.0 1.0	μg/ł μg/ł	-	1		1/6/2007
gamma-Chlord	ane		ND	1.0	μg/r μg/ł		1		1/6/2007
Heptachlor			ND	1.0	μg/r μg/ł		1		1/6/2007
Heptachlor epo	oxide		ND	1.0	μg/r μg/ł	-	1		1/6/2007
Methoxychlor			ND	8.5	μg/ł		1		1/6/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

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CLIENT:	Geocon Con	sultants, Inc.		C	lient Sampl	le ID: B2-4'					
Lab Order:	088870			Tag Number:							
Project:	VCC, A848'	7-77-02		Collection Date: 1/3/2007 9:45:00 AM							
Lab ID: 088870-007A					Ma	atrix: SOIL					
Analyses		Resu	ılt	PQL (	Qual Units	DF	Date	Analyzed			
ORGANOCH	LORINE PESTICI	DES BY GC/ECD EPA 3550B			EPA 80	81A					
RunID: GC1	0_070105A	QC Batch:	32599			PrepDate:	1/5/2007	Analyst: VLT			
			D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT: Lab Order:	Geocon Consult 088870				Tag	Num	e ID: B2-8 ber: Date: 1/3/2		)·55·00 AI	Л
Project: Lab ID:	VCC, A8487-77 088870-009A	-02			Conecu		trix: SOI		7.55.00 AN	VI
Analyses	000070 00711	Re	esult	PQL	Qual U			DF	Date	Analyzed
ICP METALS				_	-					-
	E	EPA 3050B			EPA	A 601	0B			
RunID: ICP5_070	108C	QC Batch:	32629				PrepDate:		1/8/2007	Analyst: RQ
Arsenic			4.1	1.0	m	g/Kg		1		1/8/2007
Arsenic			ND	1.0	m	g/Kg		1		1/8/2007
Lead			ND	1.0		g/Kg		1		1/8/2007
Lead			5.2	1.0	m	g/Kg		1		1/8/2007
HYDROCARBON	CHAIN IDENTIF	ICATION								
	L	.UFT			EPA 8	8015	B(M)			
RunID: GC7_070	108A	QC Batch:	32634				PrepDate:		1/8/2007	Analyst: CBR
T/R Hydrocarbons	s: C8-C10		ND	10	m	g/Kg		1		1/8/2007
T/R Hydrocarbons			ND	10		g/Kg		1		1/8/2007
T/R Hydrocarbons	s: C18-C28		ND	10		ig/Kg		1		1/8/2007
T/R Hydrocarbons	s: C28-C36		ND	10	m	g/Kg		1		1/8/2007
T/R Hydrocarbons	s: C36-C40		ND	10	m	g/Kg		1		1/8/2007
T/R Hydrocarbons	s: C8-C40 Total		ND	10	m	g/Kg		1		1/8/2007
ORGANOCHLOR	INE PESTICIDES	BY GC/EC	D							
	E	EPA 3550B			EPA	808	51 <b>A</b>			
RunID: GC10_07	0105A	QC Batch:	32599				PrepDate:		1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	μί	g/Kg		1		1/6/2007
4,4´-DDE			ND	2.0	μί	g/Kg		1		1/6/2007
4,4´-DDT			ND	2.0	μί	g/Kg		1		1/6/2007
Aldrin			ND	1.0	μç	g/Kg		1		1/6/2007
alpha-BHC			ND	1.0	μç	g/Kg		1		1/6/2007
alpha-Chlordane			ND	1.0	μί	g/Kg		1		1/6/2007
beta-BHC			ND	1.0	μί	g/Kg		1		1/6/2007
Chlordane			ND	8.5	μί	g/Kg		1		1/6/2007
delta-BHC			ND	1.0		g/Kg		1		1/6/2007
Dieldrin			ND	2.0	μί	g/Kg		1		1/6/2007
Endosulfan I			ND	1.0		g/Kg		1		1/6/2007
Endosulfan II			ND	2.0	μί	g/Kg		1		1/6/2007
Endosulfan sulfate	9		ND	2.0		g/Kg		1		1/6/2007
Endrin			ND	2.0		g/Kg		1		1/6/2007
Endrin aldehyde			ND	2.0		g/Kg		1		1/6/2007
Endrin ketone			ND	2.0	μί	g/Kg		1		1/6/2007
gamma-BHC			ND	1.0	μç	g/Kg		1		1/6/2007
gamma-Chlordan	e		ND	1.0		g/Kg		1		1/6/2007
Heptachlor			ND	1.0	μο	g/Kg		1		1/6/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

Spike/Surrogate outside of limits due to matrix interference

S DO Surrogate Diluted Out ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

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CLIEN	T: Geocon Con	sultants, Inc.		С	lient Sample	<b>ID:</b> B2-8'				
Lab Or	rder: 088870		Tag Number:							
Project	t: VCC, A848	7-77-02	Collection Date: 1/3/2007 9:55:00 AM							
Lab ID	<b>:</b> 088870-009	А			Mat	trix: SOIL				
Analyse	es	Res	sult	PQL 0	Qual Units	DF	Date	Analyzed		
ORGAN	NOCHLORINE PESTICI	DES BY GC/ECD EPA 3550B	)		EPA 808	1A				
RunID:	GC10_070105A	QC Batch:	32599			PrepDate:	1/5/2007	Analyst: VLT		
	chlor epoxide		ND	1.0	µg/Kg	1		1/6/2007		
Heptad					- 3 3					
Heptao Metho	•		ND	8.5	µg/Kg	1		1/6/2007		

Date: 10-Jan-07

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

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CLIENT:	Geocon Cons	ultants, Inc.			<b>Client Sam</b>	ple ID: B3	-2'		
Lab Order:	088870				Tag Nu	umber:			
Project:	VCC, A8487-	-77-02			-	<b>Date:</b> 1/3	/2007	10:05:00 A	М
Lab ID:	088870-010A				Ν	Aatrix: SO	IL		
Analyses		Result		PQL Qual Units		ts	DF	Date Analyzed	
ICP METALS		-		t	<b>C</b> <sup></sup>				
		EPA 3050B			EPA 6	010B			
RunID: ICP5_(	)70108C	QC Batch:	32629			PrepDate	):	1/8/2007	Analyst: RQ
Arsenic			ND	1.0	mg/l		1		1/8/2007
Lead			1.6	1.0	mg/l	-	1		1/8/2007
	ON CHAIN IDENT	IFICATION	1.0	1.0	iiig/i	<b>v</b> g			1/0/2001
		LUFT			EPA 80	15B(M)			
RunID: GC7 0	70108A	QC Batch:	32634			PrepDate	):	1/8/2007	Analyst: CBR
T/R Hydrocarbo			ND	10	mg/l	•	1		1/8/2007
T/R Hydrocarbo			ND	10	mg/l	-	1		1/8/2007
T/R Hydrocarbo			20	10	mg/l	-	1		1/8/2007
T/R Hydrocarbo			45	10	mg/l	-	1		1/8/2007
T/R Hydrocarbo			35	10	mg/l	-	1		1/8/2007
	ons: C8-C40 Total		100	10	mg/l	-	1		1/8/2007
•	ORINE PESTICID	ES BY GC/EC			5	5			
		EPA 3550B	-		EPA 8	081A			
RunID: GC10_	070105A	QC Batch:	32599			PrepDate	):	1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/k	g	1		1/6/2007
4,4´-DDE			ND	2.0	µg/K	g	1		1/6/2007
4,4´-DDT			ND	2.0	µg/k	(g	1		1/6/2007
Aldrin			ND	1.0	µg/k	(g	1		1/6/2007
alpha-BHC			ND	1.0	µg/k		1		1/6/2007
alpha-Chlordan	ie		ND	1.0	µg/K		1		1/6/2007
beta-BHC			ND	1.0	µg/k	-	1		1/6/2007
Chlordane			ND	8.5	µg/K		1		1/6/2007
delta-BHC			ND	1.0	µg/k	-	1		1/6/2007
Dieldrin			ND	2.0	µg/k		1		1/6/2007
Endosulfan I			ND	1.0	µg/k		1		1/6/2007
Endosulfan II	6-4-		ND	2.0	µg/k	-	1		1/6/2007
Endosulfan sult	late		ND	2.0	µg/k		1		1/6/2007
Endrin Endrin oldobud	•			2.0	µg/k		1		1/6/2007
Endrin aldehyd	E		ND ND	2.0 2.0	µg/k		1		1/6/2007 1/6/2007
Endrin ketone gamma-BHC			ND ND	2.0 1.0	μg/k μg/k	-	1 1		1/6/2007
gamma-Chlord	ane		ND	1.0			1		1/6/2007
Heptachlor			ND	1.0	hd\k hd\k		1		1/6/2007
Heptachlor epo	xide		ND	1.0	μg/κ μg/k	-	1		1/6/2007
i lopidonioi opu				1.0	μ9/1	.9			1,0,2001

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

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CLIENT:	Geocon Con	nsultants, Inc.		Clien	t Sample I	<b>D:</b> B3-2'					
Lab Order	•: 088870			Tag Number:							
Project:	VCC, A848	7-77-02		Collection Date: 1/3/2007 10:05:00 AM							
Lab ID: 088870-010A					Matri	ix: SOIL					
Analyses		Resu	lt	PQL Qua	l Units	DF	Date	Analyzed			
ORGANOC	HLORINE PESTIC	IDES BY GC/ECD EPA 3550B			EPA 8081 <i>A</i>	A					
RunID: GO	C10_070105A	QC Batch:	32599		P	repDate:	1/5/2007	Analyst: VLT			
			ID	85	µg/Kg			1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Con	sultants, Inc.			<b>Client Sam</b>	ple ID: B3	-6'		
Lab Order:	088870				Tag Nu	umber:			
Project:	VCC, A8487	7-77-02			-	n Date: 1/3	/2007	10:13:00 A	М
Lab ID:	088870-012				Ν	Aatrix: SO	IL		
Analyses			sult	PQL Qual Units		ts	DF	Date Analyzed	
-			suit	IQL	Quai em	65	DI	Dute	1 mary 2cu
ICP METALS		EPA 3050B			EPA 6	010B			
RunID: ICP5_	070108C	QC Batch:	32629			PrepDate		1/8/2007	Analyst: <b>RQ</b>
_			4.8	1.0	ma/l			170/2001	1/8/2007
Arsenic				1.0	mg/ł	-	1		
	ON CHAIN IDEN	TIEICATION	4.9	1.0	mg/ł	Ng	1		1/8/2007
TIDROCARD	ON CHAIN IDEN	LUFT			EPA 80	15B(M)			
	2204004	-	00004					4/0/0007	
	070108A	QC Batch:	32634			PrepDate		1/8/2007	Analyst: CBR
T/R Hydrocarb			ND	10	mg/l	-	1		1/8/2007
T/R Hydrocarb			ND	10	mg/l	-	1		1/8/2007
T/R Hydrocarb			ND	10	mg/l	-	1		1/8/2007
T/R Hydrocarb			ND	10	mg/l	-	1		1/8/2007
T/R Hydrocarb			ND	10	mg/l	-	1		1/8/2007
•	ons: C8-C40 Total		ND	10	mg/l	≺g	1		1/8/2007
ORGANOCHL	ORINE PESTICI	DES BY GC/ECI EPA 3550B	D		EPA 8	081A			
RunID: GC10	_070105A	QC Batch:	32599			PrepDate	:	1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/k	(g	1		1/6/2007
4,4´-DDE			ND	2.0	μg/K	-	1		1/6/2007
4,4´-DDT			ND	2.0	μg/K		1		1/6/2007
Aldrin			ND	1.0	μg/K	-	1		1/6/2007
alpha-BHC			ND	1.0	μg/K	-	1		1/6/2007
alpha-Chlorda	ne		ND	1.0	μg/k		1		1/6/2007
beta-BHC			ND	1.0	μg/K		1		1/6/2007
Chlordane			ND	8.5	μg/k	-	1		1/6/2007
delta-BHC			ND	1.0	µg/K		1		1/6/2007
Dieldrin			ND	2.0	μg/k	-	1		1/6/2007
Endosulfan I			ND	1.0	μg/k		1		1/6/2007
Endosulfan II			ND	2.0	μg/k		1		1/6/2007
Endosulfan su	lfate		ND	2.0	µg/k	-	1		1/6/2007
Endrin			ND	2.0	µg/k		1		1/6/2007
Endrin aldehyd	de		ND	2.0	µg/k		1		1/6/2007
Endrin ketone			ND	2.0	µg/k		1		1/6/2007
gamma-BHC			ND	1.0	µg/k	(g	1		1/6/2007
gamma-Chloro	lane		ND	1.0	μg/K		1		1/6/2007
Heptachlor			ND	1.0	μg/k		1		1/6/2007
Heptachlor epo	oxide		ND	1.0	μg/K	-	1		1/6/2007
Methoxychlor			ND	8.5	μg/K		1		1/6/2007

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

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CLIENT:	Geocon Co	nsultants, Inc.		Client Sample ID: B3-6'							
Lab Orde	er: 088870			Tag Number:							
Project:	VCC, A848	37-77-02		Collection Date: 1/3/2007 10:13:00 AM							
Lab ID:	Lab ID: 088870-012A				Matı	ix: SOIL					
Analyses		Resu	lt PQ	L Qual	Units	DF	Date	Analyzed			
ORGANO	CHLORINE PESTIC	IDES BY GC/ECD EPA 3550B		E	PA 8081	A					
RunID: G	C10_070105A	QC Batch:	32599		F	PrepDate:	1/5/2007	Analyst: VLT			
			ID 8	35	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Consu	ltants, Inc.			Client Sample	e <b>ID:</b> B4-4'		
Lab Order:	088870				Tag Nun	iber:		
Project:	VCC, A8487-7	7-02			0	Date: 1/3/2007	10:30:00 A	M
Lab ID: 088870-015A						trix: SOIL		
Analyses		Re	sult	PQL	Qual Units	DF	Date	Analyzed
ICP METALS								
		EPA 3050B			EPA 601	0B		
RunID: ICP5_07	70108C	QC Batch:	32629			PrepDate:	1/8/2007	Analyst: RQ
Arsenic			3.1	1.0	mg/Kg	1		1/8/2007
Lead			6.1	1.0	mg/Kg	1		1/8/2007
HYDROCARBO	N CHAIN IDENTI	FICATION			0 0			
		LUFT			EPA 8015	B(M)		
RunID: GC7_07	0108A	QC Batch:	32634			PrepDate:	1/8/2007	Analyst: CBR
T/R Hydrocarbo	ns: C8-C10		ND	10	mg/Kg	1		1/8/2007
T/R Hydrocarbo			ND	10	mg/Kg	1		1/8/2007
T/R Hydrocarbo			19	10	mg/Kg	1		1/8/2007
T/R Hydrocarbo			45	10	mg/Kg	1		1/8/2007
T/R Hydrocarbo			26	10	mg/Kg	1		1/8/2007
	ns: C8-C40 Total		90	10	mg/Kg	1		1/8/2007
	RINE PESTICIDE	S BY GC/ECI	D					
		EPA 3550B			EPA 808	31A		
RunID: GC10_0	070105A	QC Batch:	32599			PrepDate:	1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/Kg	1		1/6/2007
4,4´-DDE			ND	2.0	µg/Kg	1		1/6/2007
4,4´-DDT			ND	2.0	µg/Kg	1		1/6/2007
Aldrin			ND	1.0	µg/Kg	1		1/6/2007
alpha-BHC			ND	1.0	µg/Kg	1		1/6/2007
alpha-Chlordane	e		ND	1.0	µg/Kg	1		1/6/2007
beta-BHC			ND	1.0	µg/Kg	1		1/6/2007
Chlordane			ND	8.5	µg/Kg	1		1/6/2007
delta-BHC			ND	1.0	µg/Kg	1		1/6/2007
Dieldrin			ND	2.0	µg/Kg	1		1/6/2007
Endosulfan I			ND	1.0	µg/Kg	1		1/6/2007
Endosulfan II			ND	2.0	µg/Kg	1		1/6/2007
Endosulfan sulfa	ate		ND	2.0	µg/Kg	1		1/6/2007
Endrin Endrin			ND	2.0	µg/Kg	1		1/6/2007
Endrin aldehyde	•		ND	2.0	µg/Kg	1		1/6/2007
Endrin ketone				2.0	µg/Kg	1		1/6/2007
gamma-BHC	20			1.0	µg/Kg	1		1/6/2007
gamma-Chlorda Heptachlor				1.0	µg/Kg	1		1/6/2007
HEDIACHIOL			ND	1.0	µg/Kg	1		1/6/2007
Heptachlor epox	ride		ND	1.0	µg/Kg	1		1/6/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

Spike/Surrogate outside of limits due to matrix interference

S DO Surrogate Diluted Out ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

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CLIENT	Geocon Co	onsultants, Inc.		Client Sample ID: B4-4'							
Lab Order: 088870				Tag Number:							
<b>Project:</b> VCC, A8487-77-02				Collection Date: 1/3/2007 10:30:00 AM							
Lab ID: 088870-015A				Matrix: SOIL							
Analyses		Resu	ılt	PQL Qual	Units	DF	Date	Analyzed			
ORGANO	CHLORINE PESTIC	CIDES BY GC/ECD EPA 3550B		E	EPA 8081A						
RunID: G	GC10_070105A	QC Batch:	32599		Pre	epDate:	1/5/2007	Analyst: VLT			
	ne		١D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Con	sultants, Inc.		Client Sample ID: B4-8'							
Lab Order:	088870			Tag Number:							
<b>Project:</b> VCC, A8487-77-02					Collection I	Date: 1/3/20	007 1	0:35:00 A	M		
Lab ID:	088870-017	088870-017A			Ma	trix: SOIL					
Analyses		Re	sult	PQL	Qual Units	]	DF	Date	Analyzed		
ICP METALS											
	704000	EPA 3050B	20000		EPA 601			4/0/0007			
_	070108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: RQ		
Arsenic			3.5	1.0	mg/Kg		1		1/8/2007		
Lead			3.4	1.0	mg/Kg		1		1/8/2007		
HYDROCARBO	ON CHAIN IDEN					-					
		LUFT			EPA 8015	B(M)					
RunID: GC7_0	)70108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR		
T/R Hydrocarb	ons: C8-C10		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarb	ons: C36-C40		ND	10	mg/Kg		1		1/8/2007		
	ons: C8-C40 Total		ND	10	mg/Kg		1		1/8/2007		
ORGANOCHL	ORINE PESTICI	DES BY GC/ECI	2								
		EPA 3550B			EPA 808	31A					
RunID: GC10_	_070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT		
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007		
Aldrin			ND	1.0	µg/Kg		1		1/6/2007		
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007		
alpha-Chlordar	ne		ND	1.0	µg/Kg		1		1/6/2007		
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Chlordane			ND	8.5	µg/Kg		1		1/6/2007		
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Dieldrin			ND	2.0	µg/Kg		1		1/6/2007		
Endosulfan I			ND	1.0	µg/Kg		1		1/6/2007		
Endosulfan II			ND	2.0	µg/Kg		1		1/6/2007		
Endosulfan sul	fate		ND	2.0	µg/Kg				1/6/2007		
Endrin			ND	2.0	µg/Kg		1		1/6/2007		
Endrin aldehyd	е		ND	2.0	µg/Kg		1		1/6/2007		
Endrin ketone			ND	2.0	µg/Kg		1		1/6/2007		
gamma-BHC			ND	1.0	µg/Kg		1		1/6/2007		
gamma-Chlord	ane		ND	1.0	µg/Kg		1		1/6/2007		
Heptachlor			ND	1.0	µg/Kg		1		1/6/2007		
Heptachlor epo	oxide		ND	1.0	µg/Kg		1		1/6/2007		
Methoxychlor			ND	8.5	µg/Kg		1		1/6/2007		

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit

Results are wet unless otherwise specified

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CLIENT:	Geocon Co	onsultants, Inc.		Client Sample ID: B4-8'							
Lab Order: 088870				Tag Number:							
<b>Project:</b> VCC, A8487-77-02				Collection Date: 1/3/2007 10:35:00 AM							
Lab ID: 088870-017A				Matrix: SOIL							
Analyses		Resu	ılt	PQL Qua	Units	DF	Date	Analyzed			
ORGANO	CHLORINE PESTIC	DES BY GC/ECD EPA 3550B			EPA 8081A						
RunID: G	C10_070105A	QC Batch:	32599		Pre	pDate:	1/5/2007	Analyst: VLT			
	ne		D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Cons	sultants, Inc.			Client Sample	e ID: B4-1	0'				
Lab Order:	088870		Tag Number:								
Project:	VCC, A8487	-77-02			Collection I	Date: 1/3/2	.007	10:35:00 A	M		
Lab ID:	088870-018A				Ma	trix: SOII					
Analyses		Re	sult	PQL	Qual Units		DF	Date	Analyzed		
ICP METALS											
		EPA 3050B			EPA 601						
_	70108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: RQ		
Arsenic			4.1	1.0	mg/Kg		1		1/8/2007		
Lead			4.8	1.0	mg/Kg		1		1/8/2007		
HYDROCARBO	ON CHAIN IDEN					D/M)					
		LUFT			EPA 8015	B(IVI)					
RunID: GC7_07	70108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR		
T/R Hydrocarbo	ons: C8-C10		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo	ons: C10-C18		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo	ons: C18-C28		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo	ons: C28-C36		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo	ons: C36-C40		ND	10	mg/Kg		1		1/8/2007		
T/R Hydrocarbo	ons: C8-C40 Total		ND	10	mg/Kg		1		1/8/2007		
ORGANOCHLC	DRINE PESTICI	DES BY GC/ECI	D								
		EPA 3550B			EPA 808	81A					
RunID: GC10_0	070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT		
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007		
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007		
Aldrin			ND	1.0	µg/Kg		1		1/6/2007		
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007		
alpha-Chlordan	е		ND	1.0	µg/Kg		1		1/6/2007		
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Chlordane			ND	8.5	µg/Kg		1		1/6/2007		
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007		
Dieldrin			ND	2.0	µg/Kg		1		1/6/2007		
Endosulfan I			ND	1.0	µg/Kg		1		1/6/2007		
Endosulfan II			ND	2.0	µg/Kg		1		1/6/2007		
Endosulfan sulf	ate		ND	2.0	µg/Kg		1		1/6/2007		
Endrin			ND	2.0	µg/Kg		1		1/6/2007		
Endrin aldehyde	e		ND	2.0	µg/Kg		1		1/6/2007		
Endrin ketone			ND	2.0	µg/Kg		1		1/6/2007		
gamma-BHC			ND	1.0	µg/Kg		1		1/6/2007		
gamma-Chlorda	ane		ND	1.0	µg/Kg		1		1/6/2007		
Heptachlor			ND	1.0	µg/Kg		1		1/6/2007		
Heptachlor epox	xide		ND	1.0	µg/Kg		1		1/6/2007		
Methoxychlor			ND	8.5	µg/Kg		1		1/6/2007		

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

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CLIENT	<b>F:</b> Geocon Co	onsultants, Inc.		Client Sample ID: B4-10'							
Lab Order: 088870				Tag Number:							
<b>Project:</b> VCC, A8487-77-02				Collection Date: 1/3/2007 10:35:00 AM							
Lab ID: 088870-018A					Matrix	K: SOIL					
Analyses	s	Resu	ılt	PQL Qual	Units	DF	Date	Analyzed			
ORGAN	OCHLORINE PESTIC	CIDES BY GC/ECD EPA 3550B		E	EPA 8081A						
RunID:	GC10_070105A	QC Batch:	32599		Pre	epDate:	1/5/2007	Analyst: VLT			
Toxaphe			١D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Cons	sultants, Inc.			<b>Client Sampl</b>	e ID: B5-2'			
Lab Order:	088870				Tag Nun	nber:			
Project:	VCC, A8487	-77-02			Collection I		007 1	0:45:00 A	М
Lab ID:	088870-019A					atrix: SOIL			
Analyses		Re	sult	PQL	Qual Units		DF	Date	Analyzed
ICP METALS					•				·
		EPA 3050B			EPA 601	10B			
RunID: ICP5_	_070108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: RQ
Arsenic			9.8	1.0	mg/Kg		1		1/8/2007
Lead			6.1	1.0	mg/Kg		1		1/8/2007
		TIFICATION	0				•		., 0, 2001
		LUFT			EPA 8015	B(M)			
RunID: GC7_	070108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007
•	oons: C10-C18		ND	10	mg/Kg		1		1/8/2007
	oons: C18-C28		ND	10	mg/Kg		1		1/8/2007
,	oons: C28-C36		ND	10	mg/Kg		1		1/8/2007
	oons: C36-C40		ND	10	mg/Kg		1		1/8/2007
	oons: C8-C40 Total		ND	10	mg/Kg		1		1/8/2007
	ORINE PESTICIE	DES BY GC/ECI			5. 5				
		EPA 3550B	-		EPA 808	81A			
RunID: GC10	_070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/Kg		1		1/8/2007
4,4´-DDE			ND	2.0	µg/Kg		1		1/8/2007
4,4´-DDT			ND	2.0	µg/Kg		1		1/8/2007
Aldrin			ND	1.0	µg/Kg		1		1/8/2007
alpha-BHC			ND	1.0	µg/Kg		1		1/8/2007
alpha-Chlorda	ne		ND	1.0	µg/Kg		1		1/8/2007
beta-BHC			ND	1.0	µg/Kg		1		1/8/2007
Chlordane			ND	8.5	µg/Kg		1		1/8/2007
delta-BHC			ND	1.0	µg/Kg		1		1/8/2007
Dieldrin			ND	2.0	µg/Kg		1		1/8/2007
Endosulfan I			ND	1.0	µg/Kg		1		1/8/2007
Endosulfan II			ND	2.0	µg/Kg		1		1/8/2007
Endosulfan su	Ilfate		ND	2.0	µg/Kg		1		1/8/2007
Endrin			ND	2.0	µg/Kg		1		1/8/2007
Endrin aldehy	de		ND	2.0	µg/Kg		1		1/8/2007
Endrin ketone			ND	2.0	µg/Kg		1		1/8/2007
gamma-BHC			ND	1.0	µg/Kg		1		1/8/2007
gamma-Chloro	dane		ND	1.0	µg/Kg		1		1/8/2007
Heptachlor			ND	1.0	µg/Kg		1		1/8/2007
Heptachlor ep	oxide		ND	1.0	µg/Kg		1		1/8/2007
Methoxychlor			ND	8.5	µg/Kg		1		1/8/2007

Date: 10-Jan-07

В Qualifiers: Н

Analyte detected in the associated Method Blank

Е Value above quantitation range

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

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<b>CLIENT:</b>	Geocon Co	onsultants, Inc.		Client Sample ID: B5-2'							
Lab Order: 088870				Т	ag Number	r:					
<b>Project:</b> VCC, A8487-77-02				Collection Date: 1/3/2007 10:45:00 AM							
Lab ID: 088870-019A				Matrix: SOIL							
Analyses		Resu	ılt	PQL Qual	Units	DF	Date	Analyzed			
ORGANO	CHLORINE PESTIC	DES BY GC/ECD EPA 3550B		E	EPA 8081A						
RunID: G	C10_070105A	QC Batch:	32599		Pre	epDate:	1/5/2007	Analyst: VLT			
	ne		١D	85	µg/Kg	1		1/8/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Cons	ultants, Inc.			Client Samp	le ID: B5-6	5'		
Lab Order:	088870				Tag Nu	mber:			
Project:	VCC, A8487-	-77-02			-	<b>Date:</b> 1/3/2	2007	10:53:00 A	М
Lab ID:	088870-021A				Μ	atrix: SOII	<u> </u>		
Analyses		Result		POL	Qual Unit	s	DF	Date Analyzed	
ICP METALS			suit	IQL	Quai enit	5	21	Dutt	Innuigzeu
		EPA 3050B			EPA 60	)10B			
RunID: ICP5_0	070108C	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: <b>RQ</b>
Arsenic			ND	1.0	mg/K		1		1/8/2007
Lead			1.3	1.0	mg/K	-	1		1/8/2007
			1.5	1.0	iiig/iX	9	I		1/0/2007
III DROGARDO		LUFT			EPA 801	5B(M)			
RunID: GC7 0	70108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR
T/R Hydrocarbo			ND	10	mg/K	•	1		1/8/2007
T/R Hydrocarbo			ND	10	mg/K	-	1		1/8/2007
T/R Hydrocarbo			14	10	mg/K	-	1		1/8/2007
T/R Hydrocarbo			19	10	mg/K	-	1		1/8/2007
T/R Hydrocarbo			16	10	mg/K mg/K	-	1		1/8/2007
	ons: C8-C40 Total		48	10	mg/K	-	1		1/8/2007
•	ORINE PESTICID	ES BY GC/ECI				5			
		EPA 3550B	-		EPA 80	081A			
RunID: GC10_	070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/Kg	9	1		1/6/2007
4,4´-DDE			ND	2.0	μg/Kg	3	1		1/6/2007
4,4´-DDT			ND	2.0	μg/Kg	9	1		1/6/2007
Aldrin			ND	1.0	μg/Kg	9	1		1/6/2007
alpha-BHC			ND	1.0	μg/Kg		1		1/6/2007
alpha-Chlordan	e		ND	1.0	μg/Kg		1		1/6/2007
beta-BHC			ND	1.0	μg/Kg	9	1		1/6/2007
Chlordane			ND	8.5	μg/Kզ		1		1/6/2007
delta-BHC			ND	1.0	μg/Kg		1		1/6/2007
Dieldrin			ND	2.0	μg/Kg		1		1/6/2007
Endosulfan I			ND	1.0	μg/Kg		1		1/6/2007
Endosulfan II			ND	2.0	μg/Kg		1		1/6/2007
Endosulfan sulf	ate		ND	2.0	µg/Kg		1		1/6/2007
Endrin	-		ND	2.0	μg/Kg		1		1/6/2007
Endrin aldehydd	е		ND	2.0	μg/Kg		1		1/6/2007
Endrin ketone gamma-BHC			ND ND	2.0	μg/Kg		1 1		1/6/2007 1/6/2007
0	ano		ND	1.0 1.0	μg/Kg				1/6/2007
gamma-Chlorda Heptachlor	ane		ND ND	1.0	μg/Kg		1 1		1/6/2007
	vide		ND	1.0	μg/Kg μg/Kg		1		1/6/2007
Heptachlor epo				1.0	UU/NU				1/0/2007

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

Results are wet unless otherwise specified

S Spike/Surrogate outside of limits due to matrix interference DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit

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CLIENT	Geocon Co	onsultants, Inc.		Client	t Sample II	<b>D:</b> B5-6'					
Lab Ord	er: 088870			Т	'ag Numbe	r:					
Project:	VCC, A84	87-77-02		Collection Date: 1/3/2007 10:53:00 AM							
Lab ID:	088870-02	088870-021A Matrix: SOIL									
Analyses		Resu	ılt	PQL Qua	Units	DF	Date	Analyzed			
ORGANC	OCHLORINE PESTIC	CIDES BY GC/ECD EPA 3550B			EPA 8081A						
RunID: (	GC10_070105A	QC Batch:	32599		Pr	epDate:	1/5/2007	Analyst: VLT			
			ND	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Con	sultants, Inc.			Client Sampl	e ID: B6-4'					
Lab Order:	088870				Tag Nun	iber:					
Project:	VCC, A8487	7-77-02			Collection I	Date: 1/3/20	07 11:07:00 A	AM			
Lab ID:	088870-0254	A			Matrix: SOIL						
Analyses		Re	sult	PQL	Qual Units	Ι	OF Date	e Analyzed			
ICP METALS											
		EPA 3050B			EPA 601						
RunID: ICP5_	070108C	QC Batch:	32629			PrepDate:	1/8/2007	Analyst: RQ			
Arsenic			ND	1.0	mg/Kg	1		1/8/2007			
Lead			ND	1.0	mg/Kg	1		1/8/2007			
HYDROCARB	ON CHAIN IDEN	TIFICATION									
		LUFT			EPA 8015	B(M)					
RunID: GC7_(	070108A	QC Batch:	32634			PrepDate:	1/8/2007	Analyst: CBR			
T/R Hydrocarb	ons: C8-C10		ND	10	mg/Kg	1		1/8/2007			
T/R Hydrocarb	ons: C10-C18		ND	10	mg/Kg	1		1/8/2007			
T/R Hydrocarb	ons: C18-C28		23	10	mg/Kg			1/8/2007			
T/R Hydrocarb	ons: C28-C36		38	10	mg/Kg			1/8/2007			
T/R Hydrocarb	ons: C36-C40		27	10	mg/Kg			1/8/2007			
T/R Hydrocarb	ons: C8-C40 Total		88	10	mg/Kg	1		1/8/2007			
ORGANOCHL	ORINE PESTICI	DES BY GC/ECI	C								
		EPA 3550B			EPA 808	31A					
RunID: GC10_	_070105A	QC Batch:	32599			PrepDate:	1/5/2007	Analyst: VLT			
4,4´-DDD			ND	2.0	µg/Kg	1		1/6/2007			
4,4´-DDE			ND	2.0	µg/Kg	1		1/6/2007			
4,4´-DDT			ND	2.0	µg/Kg	1		1/6/2007			
Aldrin			ND	1.0	µg/Kg	1		1/6/2007			
alpha-BHC			ND	1.0	µg/Kg	1		1/6/2007			
alpha-Chlordar	ne		ND	1.0	µg/Kg	1		1/6/2007			
beta-BHC			ND	1.0	µg/Kg	1		1/6/2007			
Chlordane			ND	8.5	µg/Kg	1		1/6/2007			
delta-BHC			ND	1.0	µg/Kg	1		1/6/2007			
Dieldrin			ND	2.0	µg/Kg	1		1/6/2007			
Endosulfan I			ND	1.0	µg/Kg	1		1/6/2007			
Endosulfan II			ND	2.0	µg/Kg	1		1/6/2007			
Endosulfan su	lfate		ND	2.0	µg/Kg	1		1/6/2007			
Endrin			ND	2.0	µg/Kg	1		1/6/2007			
Endrin aldehyd	de		ND	2.0	µg/Kg	1		1/6/2007			
Endrin ketone			ND	2.0	µg/Kg	1		1/6/2007			
gamma-BHC			ND	1.0	µg/Kg	1		1/6/2007			
gamma-Chloro	lane		ND	1.0	µg/Kg	1		1/6/2007			
Heptachlor			ND	1.0	µg/Kg	1		1/6/2007			
Heptachlor epo	oxide		ND	1.0	µg/Kg	1		1/6/2007			
Methoxychlor			ND	8.5	µg/Kg	1		1/6/2007			

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

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CLIENT	: Geocon Co	onsultants, Inc.		Clier	nt Sample I	<b>D:</b> B6-4'					
Lab Ord	er: 088870			Tag Number:							
Project:	VCC, A84	87-77-02		Collection Date: 1/3/2007 11:07:00 AM							
Lab ID:	088870-02	5A	ix: SOIL	: SOIL							
Analyses		Resu	ılt	PQL Qua	al Units	DF	Date	Analyzed			
ORGANO	CHLORINE PESTIC	DES BY GC/ECD EPA 3550B			EPA 8081	A					
RunID: 0	GC10_070105A	QC Batch:	32599		F	PrepDate:	1/5/2007	Analyst: VLT			
			D	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Cons	ultants, Inc.			Client Sampl	e ID: B6-8'			
Lab Order:	088870				Tag Nun	nber:			
Project:	VCC, A8487-	-77-02			Collection 1	1:15:00 A	М		
Lab ID:	088870-027A	L Contraction of the second			Ma				
Analyses		Result		PQL	Qual Units		DF	Date Analyzed	
ICP METALS		EPA 3050B				100			
RunID: ICP5	070108C	QC Batch:	32629		EPA 60 <sup>-</sup>			1/9/2007	Analysty DO
_	0701060	QC Balch.				PrepDate:		1/8/2007	Analyst: RQ
Arsenic			ND	1.0	mg/Kg		1		1/8/2007
Lead			ND	1.0	mg/Kg		1		1/8/2007
HYDROCARB	ON CHAIN IDENT				EPA 8015	5B(M)			
RunID: GC7 (	070108A	QC Batch:	32634			PrepDate:		1/8/2007	Apolyot: CBR
		QC Datch.		10		•	4	1/0/2007	Analyst: CBR
T/R Hydrocarb T/R Hydrocarb			ND ND	10 10	mg/Kg		1 1		1/8/2007 1/8/2007
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007
T/R Hydrocarb			ND	10	mg/Kg mg/Kg		1		1/8/2007
T/R Hydrocarb			ND	10	mg/Kg		1		1/8/2007
	ons: C8-C40 Total		ND	10	mg/Kg		1		1/8/2007
				10	ing/rtg				1/0/2001
ONCANCONE		EPA 3550B			EPA 80	81A			
RunID: GC10_	_070105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007
Aldrin			ND	1.0	µg/Kg		1		1/6/2007
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007
alpha-Chlordar	ne		ND	1.0	µg/Kg		1		1/6/2007
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007
Chlordane			ND	8.5	µg/Kg		1		1/6/2007
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007
Dieldrin			ND	2.0	µg/Kg		1		1/6/2007
Endosulfan I			ND	1.0	µg/Kg		1		1/6/2007
Endosulfan II	lfata		ND	2.0	µg/Kg		1		1/6/2007
Endosulfan sul	liale		ND	2.0	µg/Kg		1		1/6/2007
Endrin Endrin oldobys	lo.		ND	2.0	µg/Kg		1		1/6/2007
Endrin aldehyc Endrin ketone			ND ND	2.0 2.0	µg/Kg		1 1		1/6/2007 1/6/2007
gamma-BHC			ND ND	2.0 1.0	µg/Kg		1		1/6/2007
gamma-Chlorc	lano		ND	1.0	μg/Kg μg/Kg		1 1		1/6/2007
Heptachlor			ND	1.0	μg/Kg μg/Kg		1		1/6/2007
Heptachlor epo	oxide		ND	1.0	μg/Kg μg/Kg		1		1/6/2007
				1.0	µg/1\g				1,0,2001

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

ND Not Detected at the Reporting Limit

S Spike/Surrogate outside of limits due to matrix interference DO Surrogate Diluted Out

Results are wet unless otherwise specified

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CLIENT	Geocon Co	onsultants, Inc.		Client	Sample II	<b>):</b> B6-8'					
Lab Ord	ler: 088870			Tag Number:							
Project:	VCC, A84	87-77-02		Collection Date: 1/3/2007 11:15:00 AM							
Lab ID:	088870-02	27A		Matrix: SOIL							
Analyses	5	Resu	ılt	PQL Qual	Units	DF	Date	Analyzed			
ORGANO		CIDES BY GC/ECD EPA 3550B		I	EPA 8081A						
RunID:	GC10_070105A	QC Batch:	32599		Pre	epDate:	1/5/2007	Analyst: VLT			
			ND	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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CLIENT:	Geocon Con	sultants. Inc.			Client Sample	e ID: B6-10	)'			
Lab Order:	088870	,			Tag Nur		-			
Project:	VCC, A8487	77-02			Collection I		007 1	11·15·00 A	м	
-						trix: SOIL		1110.001		
Lab ID:	088870-028	P			IVIA	uix. soil				
Analyses		Re	sult	PQL	Qual Units		DF	Date	Analyzed	
ICP METALS										
		EPA 3050B			EPA 601	08				
RunID: ICP5_07	70109A	QC Batch:	32629			PrepDate:		1/8/2007	Analyst: <b>RQ</b>	
Arsenic			ND	1.0	mg/Kg		1		1/9/2007	
Lead			ND	1.0	mg/Kg		1		1/9/2007	
HYDROCARBO	N CHAIN IDEN	TIFICATION								
		LUFT			EPA 8015	B(M)				
RunID: GC7_07	0108A	QC Batch:	32634			PrepDate:		1/8/2007	Analyst: CBR	
T/R Hydrocarbo	ns: C8-C10		ND	10	mg/Kg		1		1/8/2007	
T/R Hydrocarbo	ns: C10-C18		ND	10	mg/Kg		1		1/8/2007	
T/R Hydrocarbo	ns: C18-C28		11	10	mg/Kg		1		1/8/2007	
T/R Hydrocarbo	ns: C28-C36		22	10	mg/Kg		1		1/8/2007	
T/R Hydrocarbo	ns: C36-C40		18	10	mg/Kg		1		1/8/2007	
T/R Hydrocarbo	ns: C8-C40 Total		51	10	mg/Kg		1		1/8/2007	
ORGANOCHLO	RINE PESTICI	DES BY GC/ECI	C							
		EPA 3550B			EPA 808	81A				
RunID: GC10_0	70105A	QC Batch:	32599			PrepDate:		1/5/2007	Analyst: VLT	
4,4´-DDD			ND	2.0	µg/Kg		1		1/6/2007	
4,4´-DDE			ND	2.0	µg/Kg		1		1/6/2007	
4,4´-DDT			ND	2.0	µg/Kg		1		1/6/2007	
Aldrin			ND	1.0	µg/Kg		1		1/6/2007	
alpha-BHC			ND	1.0	µg/Kg		1		1/6/2007	
alpha-Chlordane	9		ND	1.0	µg/Kg		1		1/6/2007	
beta-BHC			ND	1.0	µg/Kg		1		1/6/2007	
Chlordane			ND	8.5	µg/Kg		1		1/6/2007	
delta-BHC			ND	1.0	µg/Kg		1		1/6/2007	
Dieldrin			ND	2.0	µg/Kg		1		1/6/2007	
Endosulfan I			ND	1.0	µg/Kg		1		1/6/2007	
Endosulfan II			ND	2.0	µg/Kg		1		1/6/2007	
Endosulfan sulfa	ate		ND	2.0	µg/Kg		1		1/6/2007	
Endrin			ND	2.0	µg/Kg		1		1/6/2007	
Endrin aldehyde			ND	2.0	µg/Kg		1		1/6/2007	
Endrin ketone			ND	2.0	µg/Kg		1		1/6/2007	
gamma-BHC			ND	1.0	µg/Kg		1		1/6/2007	
gamma-Chlorda	ne		ND	1.0	µg/Kg		1		1/6/2007	
Heptachlor			ND	1.0	µg/Kg		1		1/6/2007	
Heptachlor epox	ide		ND	1.0	µg/Kg		1		1/6/2007	
Methoxychlor			ND	8.5	µg/Kg		1		1/6/2007	

Date: 10-Jan-07

#### В Qualifiers: Н

Analyte detected in the associated Method Blank Holding times for preparation or analysis exceeded Е Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

S Spike/Surrogate outside of limits due to matrix interference

DO Surrogate Diluted Out

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CLIENT:	Geocon Cor	sultants, Inc.		Client							
Lab Order:	088870			Tag Number:							
Project:	VCC, A848	7-77-02		Collection Date: 1/3/2007 11:15:00 AM							
Lab ID:	088870-028	088870-028A Matrix: SOIL									
Analyses		Resu	lt	PQL Qual	Units	DF	Date	Analyzed			
ORGANOCHI	ORINE PESTIC	DES BY GC/ECD EPA 3550B		E	PA 8081A						
RunID: GC10	_070105A	QC Batch:	32599		Pre	pDate:	1/5/2007	Analyst: VLT			
Toxaphene			ID	85	µg/Kg	1		1/6/2007			

Qualifiers:

B Analyte detected in the associated Method Blank

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

E Value above quantitation range

ND Not Detected at the Reporting Limit Results are wet unless otherwise specified

Date: 10-Jan-07

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VCC, A8487-77-02

Work Order:

**Project:** 

### ANALYTICAL QC SUMMARY REPORT

### TestCode: 6010\_S

Sample ID:	MB-32629	SampType: MBLK	TestCode: 6010_S	Units: mg/Kg	Prep Date: 1/8/2007	RunNo: 72631
Client ID:	PBS	Batch ID: 32629	TestNo: EPA 6010	B EPA 3050B	Analysis Date: 1/8/2007	SeqNo: 1088093
Analyte		Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Arsenic		ND	1.0			
Lead		ND	1.0			
Sample ID:	LCS-32629	SampType: LCS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 1/8/2007	RunNo: 72631
Client ID:	LCSS	Batch ID: 32629	TestNo: EPA 6010	B EPA 3050B	Analysis Date: 1/8/2007	SeqNo: 1088094
Analyte		Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Arsenic		50.207	1.0 50.00	0	100 80 120	
Lead		52.922	1.0 50.00	0	106 80 120	
Sample ID:	MB-32629	SampType: MBLK	TestCode: 6010_S	Units: mg/Kg	Prep Date: 1/8/2007	RunNo: 72646
Client ID:	PBS	Batch ID: 32629	TestNo: EPA 6010	B EPA 3050B	Analysis Date: 1/9/2007	SeqNo: 1088341
Analyte		Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Arsenic		ND	1.0			
Lead		ND	1.0			
Sample ID:	LCS-32629	SampType: LCS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 1/8/2007	RunNo: 72646
Client ID:	LCSS	Batch ID: 32629	TestNo: EPA 6010	B EPA 3050B	Analysis Date: 1/9/2007	SeqNo: 1088342
Analyte		Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Arsenic		47.709	1.0 50.00	0	95.4 80 120	
Lead		49.974	1.0 50.00	0	99.9 80 120	
Sample ID:	088870-028AMS	SampType: MS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 1/8/2007	RunNo: 72646
Client ID:	B6-10'	Batch ID: 32629	TestNo: EPA 6010	B EPA 3050B	Analysis Date: 1/9/2007	SeqNo: 1088343
Analyte		Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual

#### **Qualifiers:**

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit

- Е Value above quantitation range
- R

H Holding times for preparation or analysis exceeded

S

- RPD outside accepted recovery limits
- Calculations are based on raw values

Spike/Surrogate outside of limits due to matrix interference Page 1 of 5

DO Surrogate Diluted Out

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**Project:** VCC, A8487-77-02

# ANALYTICAL QC SUMMARY REPORT

#### TestCode: 6010\_S

Sample ID: 088870-028AMS	SampType: <b>MS</b>	TestCode: 6010_S	Units: mg/Kg		Prep Date	e: 1/8/200	7	RunNo: 726	646	
Client ID: B6-10'	Batch ID: 32629	TestNo: EPA 6010B	EPA 3050B	1	Analysis Date	e: <b>1/9/200</b>	7	SeqNo: 108	88343	
Analyte	Result	PQL SPK value	PK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	75.769	1.0 125.0	0	60.6	61	104				S
Lead	75.385	1.0 125.0	0	60.3	37	128				
Sample ID: 088870-028AMSD	SampType: MSD	TestCode: 6010_S	Units: mg/Kg		Prep Date	e: 1/8/200	7	RunNo: 726	646	
Sample ID: 088870-028AMSD Client ID: B6-10'	SampType: MSD Batch ID: 32629	TestCode: 6010_S TestNo: EPA 6010B	Units: mg/Kg EPA 3050B	,	Prep Date Analysis Date			RunNo: 726 SeqNo: 108		
			EPA 3050B	, %REC	Analysis Date	e: 1 <b>/9/200</b>				Qual
Client ID: B6-10'	Batch ID: 32629	TestNo: EPA 6010B	EPA 3050B		Analysis Date	e: 1 <b>/9/200</b>	7	SeqNo: 108	88345	Qual

#### Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out

- E Value above quantitation range
- R RPD outside accepted recovery limits Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference Page 2 of 5

**Project:** VCC, A8487-77-02

# ANALYTICAL QC SUMMARY REPORT

TestCode: 8081\_S

Sample ID: MB-32599	SampType: MBLK	TestCode: 8081_S	Units: µg/Kg	Prep Date: 1/5/2007 RunNo: 72653	
Client ID: PBS	Batch ID: 32599	TestNo: EPA 8081A	EPA 3550B	Analysis Date: 1/5/2007 SeqNo: 1088443	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit G	Qual
4,4´-DDD	ND	2.0			
4,4´-DDE	ND	2.0			
4,4´-DDT	ND	2.0			
Aldrin	ND	1.0			
alpha-BHC	ND	1.0			
alpha-Chlordane	ND	1.0			
beta-BHC	ND	1.0			
Chlordane	ND	8.5			
delta-BHC	ND	1.0			
Dieldrin	ND	2.0			
Endosulfan I	ND	1.0			
Endosulfan II	ND	2.0			
Endosulfan sulfate	ND	2.0			
Endrin	ND	2.0			
Endrin aldehyde	ND	2.0			
Endrin ketone	ND	2.0			
gamma-BHC	ND	1.0			
gamma-Chlordane	ND	1.0			
Heptachlor	ND	1.0			
Heptachlor epoxide	ND	1.0			
Methoxychlor	ND	8.5			
Toxaphene	ND	85			
Sample ID: LCS-32599	SampType: LCS	TestCode: 8081_S	Units: µg/Kg	Prep Date: 1/5/2007 RunNo: 72653	
Client ID: LCSS	Batch ID: 32599	TestNo: EPA 8081A	EPA 3550B	Analysis Date: 1/5/2007 SeqNo: 1088444	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit G	Qual
Aldrin	16.686	1.0 16.67	0	100 81 130	
Dieldrin	15.785	2.0 16.67	0	94.7 78 124	
Endrin	22.374	2.0 16.67	0	134 90 145	

#### Qualifiers:

B Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

DO Surrogate Diluted Out

E Value above quantitation range

R RPD outside accepted recovery limits Calculations are based on raw values H Holding times for preparation or analysis exceeded

S Spike/Surrogate outside of limits due to matrix interference Page 3 of 5

**Project:** VCC, A8487-77-02

# ANALYTICAL QC SUMMARY REPORT

#### TestCode: 8081\_S

Sample ID: LCS-32599	SampType: LCS	TestCode: 8	081_S	Units: µg/Kg		Prep Dat	e: 1/5/200	)7	RunNo: 726	653	
Client ID: LCSS	Batch ID: 32599	TestNo: E	PA 8081A	EPA 3550B		Analysis Dat	e: 1/5/200	)7	SeqNo: 108	38444	
Analyte	Result	PQL SF	PK value S	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
gamma-BHC	16.080	1.0	16.67	0	96.5	82	128				
Heptachlor	16.519	1.0	16.67	0	99.1	72	145				
Sample ID: MB-32599	SampType: MBLK	TestCode: 8	081_S	Units: µg/Kg		Prep Dat	e: 1/5/200	)7	RunNo: 726	653	
Client ID: PBS	Batch ID: 32599	TestNo: E	PA 8081A	EPA 3550B		Analysis Dat	e: 1/8/200	)7	SeqNo: 108	38462	
Analyte	Result	PQL SF	PK value S	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	8.5									
Toxaphene	ND	85									

#### Qualifiers:

B Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

DO Surrogate Diluted Out

- E Value above quantitation range
- R RPD outside accepted recovery limits Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference Page 4 of 5

# Work Order:0Project:V

VCC, A8487-77-02

# ANALYTICAL QC SUMMARY REPORT

#### TestCode: 8081\_S

Sample ID: LCS-32599	SampType: LCS	Units: µg/Kg		Prep Dat	e: 1/5/200	17	RunNo: 726	53			
Client ID: LCSS	Batch ID: 32599	TestNo	: EPA 8081A	EPA 3550B		Analysis Dat	e: 1/8/200	17	SeqNo: 108	8463	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	16.624	1.0	16.67	0	99.7	81	130				
Dieldrin	15.873	2.0	16.67	0	95.2	78	124				
Endrin	22.714	2.0	16.67	0	136	90	145				
gamma-BHC	16.132	1.0	16.67	0	96.8	82	128				
Heptachlor	16.893	1.0	16.67	0	101	72	145				
Sample ID: 088870-019AMS	SampType: <b>ms</b>	TestCode	: 8081_S	Units: µg/Kg		Prep Dat	e: 1/5/200	17	RunNo: 726	53	
Client ID: B5-2'	Batch ID: 32599	TestNo	EPA 8081A	EPA 3550B		Analysis Dat	e: <b>1/8/200</b>	17	SeqNo: 108	8466	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	14.842	2.0	16.67	0	89.0	39	159				
Aldrin	14.829	1.0	16.67	0	89.0	65	140				
Dieldrin	14.453	2.0	16.67	0	86.7	48	158				
Endrin	20.957	2.0	16.67	0	126	75	170				
gamma-BHC	14.194	1.0	16.67	0	85.1	59	145				
Heptachlor	15.451	1.0	16.67	0	92.7	61	156				
Sample ID: 088870-019AMSD	SampType: msd	TestCode	: 8081_S	Units: µg/Kg		Prep Dat	e: 1/5/200	17	RunNo: 726	53	
Client ID: B5-2'	Batch ID: 32599	TestNo	EPA 8081A	EPA 3550B		Analysis Dat	e: 1/8/200	17	SeqNo: 108	88467	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	14.746	2.0	16.67	0	88.5	39	159	14.84	0.650	30	
Aldrin	14.319	1.0	16.67	0	85.9	65	140	14.83	3.49	30	
Dieldrin	14.095	2.0	16.67	0	84.6	48	158	14.45	2.50	30	
Endrin	20.385	2.0	16.67	0	122	75	170	20.96	2.77	30	
gamma-BHC	13.485	1.0	16.67	0	80.9	59	145	14.19	5.12	30	
Heptachlor	14.830	1.0	16.67	0	89.0	61	156	15.45	4.10	30	

#### Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit

DO Surrogate Diluted Out

- E Value above quantitation rangeR RPD outside accepted recovery limits
- -

- H Holding times for preparation or analysis exceeded
  - S Spike/Surrogate outside of limits due to matrix interference Page 5 of 5

Calculations are based on raw values

VCC, A8487-77-02

Work Order:

**Project:** 

### ANALYTICAL QC SUMMARY REPORT

BatchID: 32634

Sample ID: MB-32634	SampType: <b>MBLK</b>	TestCode: 8015_S_DM Units: mg/Kg Prep D	ate: 1/8/2007	RunNo: 72633
Client ID: PBS	Batch ID: 32634	TestNo: EPA 8015B(M LUFT Analysis D	ate: 1/8/2007	SeqNo: 1088136
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual
DRO ORO	ND ND	10 10		
Sample ID: LCS-32634	SampType: LCS	TestCode: 8015_S_DM Units: mg/Kg Prep D	ate: 1/8/2007	RunNo: 72633
Client ID: LCSS	Batch ID: 32634	TestNo: EPA 8015B(M LUFT Analysis D	ate: 1/8/2007	SeqNo: 1088137
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual
DRO	789.582	10 1000 0 79.0 67	131	
Sample ID: 088870-001AMS Client ID: B1-2'	SampType: <b>MS</b> Batch ID: <b>32634</b>		ate: 1/8/2007 Date: 1/8/2007	RunNo: <b>72633</b> SeqNo: <b>1088138</b>
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual
DRO	809.069	10 1000 26.26 78.3 48	3 143	
Sample ID: 088870-001AMSD Client ID: B1-2'	SampType: <b>MSD</b> Batch ID: <b>32634</b>	5.5	Pate: 1/8/2007 Pate: 1/8/2007	RunNo: <b>72633</b> SeqNo: <b>1088139</b>
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual
DRO	804.106	10 1000 26.26 77.8 48	8 143 809.1	0.615 30
Sample ID: MB-32634 Client ID: PBS	SampType: MBLK Batch ID: 32634		ate: 1/8/2007 Pate: 1/8/2007	RunNo: <b>72633</b> SeqNo: <b>1088165</b>
Analyte	Result	PQL SPK value SPK Ref Val %REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit Qual
T/R Hydrocarbons: C8-C10 T/R Hydrocarbons: C10-C18	ND ND	10 10		

#### Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit

E Value above quantitation range

R Calculations are based on raw values

DO Surrogate Diluted Out

RPD outside accepted recovery limits

- Holding times for preparation or analysis exceeded Н
- Spike/Surrogate outside of limits due to matrix interference Page 1 of 2 S

**Project:** VCC, A8487-77-02

# ANALYTICAL QC SUMMARY REPORT

BatchID: 32634

Sample ID: MB-32634	SampType: MBLK	TestCode:	HC_S_ATL	Units: mg/Kg		Prep Da	te: 1/8/200	)7	RunNo: 726	33	
Client ID: PBS	Batch ID: 32634	TestNo:	EPA 8015B	(M LUFT		Analysis Da	te: 1/8/200	)7	SeqNo: 108	8165	
Analyte	Result	PQL S	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C18-C28	ND	10									
T/R Hydrocarbons: C28-C36	ND	10									
T/R Hydrocarbons: C36-C40	ND	10									
T/R Hydrocarbons: C8-C40 Total	ND	10									

#### Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out

- E Value above quantitation range
- R RPD outside accepted recovery limits Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference Page 2 of 2

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DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

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Advanced Technology Laboratories	P.O.#:			Client 🗆 ATL 📌	1. CHILLED	Y D N D 4. SEALED	Y 🗆 N 🗆
3275 Walnut Avenue Signal Hill, CA 90755	Logged By:	0	Date: 01/03/57	CA OverN	2. HEADSPACE (VOA)	Y N N S. # OF SPLS MA	TCH COC Y D N D
(562) 989-4045 • Fax (562) 989-4040				Other:	3. CONTAINER INTACT	Y N N 6. PRESERVED	) Y 🗆 N 🗆
Client: 6 EGCOL	Aa	Addr	1055: 3303 N, S	AND FERIAN	D BLUD \$100	TEL: (8,8) 2	341-8388
Attn: MILLSE CONKEE			BURBANIS	State	CA Zip Code 9/	504 FAX:(818)8	41-1704
Project Name:	Project #	#:	Sampler:	(Printed Name)	-	jnature)	
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Sample/Records - Archival & Disposal Unless otherwise requested by client, all sampl receipt and records will be disposed 1 year afte			Circle or Add Analysis(es) Requested		8	SPECIFY APPROPRIATE MATRIX	Z RTNE C
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DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

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### **Diane Galvan**

From:	Dave Darrow	[darrow@geoconinc.com]
		[uarren @geeeennieleenn]

Sent: Thursday, January 04, 2007 11:55 AM

To: Bing Roura; Diane Galvan

Cc: Mike Conkle

Subject: modified COCs

×

Bing,

The attached COCs have been modified as we discussed.

Sincerely,

×

David C. Darrow, REA II Senior Environmental Scientist

Geocon Consultants, Inc. <u>www.geoconinc.com</u> 41571 Corning Place, Suite 101 Murrieta, CA 92562-7065

951.304.2300 phone 951.304.2642 fax 951.704.4491 cell

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San Diego Murrieta San Bernadino Los Angeles Sacramento Reno/Lake Tahoe Pleasanton Portland Las Vegas Bakersfield

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# **APPENDIX B**

# Soil Matrix Analytical Data Cal Tech Environmental Laboratories June 2015

CAL TECH Environmental Laboratories



6814 Rosecrans Avenue,Paramount, CA 90723-3146Telephone: (562) 272-2700Fax: (562) 272-2789

# ANALYTICAL RESULTS\*

CTEL Project No: Client Name:	Hillman 1745 W	1506084 Consulting Orangewood Av CA 92868	ve.		Phone:(714) 2 Fax: (714) 6		
Attention:	Mr. Dan	h Louks / Brandon	n Clements				
Project ID:	Vacant l	Land					
Project Name:	29508 R	Roadside, Agoura					
Date Sampled:	<b>06</b> /11/1:	5 @ 09:30 am			Matrix: Soil		
Date Received:	06/12/1:	5 @ 08:15 am					
Date Analyzed:	06/12/15	5					
Laboratory ID:		1506-084-2	1506-084-5	1506-084-9	Method	Units:	Detection
<b>Client Sample ID:</b>		B7-10	<b>B8-10</b>	B9-10			Limit
Dilution		1	1	1			
Dichlorodifluorometh	ane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chloromethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Vinyl Chloride		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromomethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Trichlorofluoromethan	ne	ND ND	ND ND	ND ND	EPA 8260B	mg/Kg	0.005
Iodomethane Acetone		ND ND	ND	ND	EPA 8260B EPA 8260B	mg/Kg mg/Kg	0.005 0.005
1,1-Dichloroethene		ND	ND	ND	EPA 8260B	mg/Kg	0.005
t-Butyl Alcohol (TBA	)	ND	ND	ND	EPA 8260B	mg/Kg	0.02
Methylene Chloride	·)	ND	ND	ND	EPA 8260B	mg/Kg	0.02
Freon 113		ND	ND	ND	EPA 8260B	mg/Kg	0.01
Carbon disùlfide		ND	ND	ND	EPA 8260B	mg/Kg	0.005
trans, 1, 2-Dichloroethe	ene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Methyl-tert-butyl-ethe	r(MtBE)	ND	ND	ND	EPA 8260B	mg/Kg	0.002
1,1-Dichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Vinyl acetate		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Diisopropyl Ether (DI	PE)	ND	ND	ND	EPA 8260B	mg/Kg	0.002
Methyl Ethyl Ketone		ND	ND	ND	EPA 8260B	mg/Kg	0.01
cis, 1, 2-Dichloroethen	e	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromochloromethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chloroform		ND ND	ND ND	ND ND	EPA 8260B	mg/Kg	0.005 0.005
2,2-Dichloropropane Ethyl-t-butyl ether (E)		ND	ND	ND	EPA 8260B EPA 8260B	mg/Kg mg/Kg	0.003
1,1,1-Trichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.002
1,2-Dichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,1-Dichloropropene		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Carbon Tetrachloride		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Benzene		ND	ND	ND	EPA 8260B	mg/Kg	0.001
t-Amyl Methyl Ether (	(TAM)	ND	ND	ND	EPA 8260B	mg/Kg	0.002
1,2-Dichloropropane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Trichloroethene		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Dibromomethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromodichloromethan		ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Chloroethylvinyleth		ND	ND	ND	EPA 8260B	mg/Kg	0.005
cis, 1, 3-Dichloroprope		ND	ND	ND	EPA 8260B	mg/Kg mg/Kg	0.005
4-Methyl-2-pentanone trans,1,3-Dichloropro		ND ND	ND ND	ND ND	EPA 8260B EPA 8260B	mg/Kg mg/Kg	0.01 0.005
Toluene	pene	ND	ND	ND ND	EPA 8260B EPA 8260B	mg/Kg	0.003
1,1,2-Trichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.001
r, r,#= r nomoroculane				1112	Li II 0400B		0.002

TOTALLY DEDICATED TO CUSTOMER SATISFACTION

# CTEL Project No: CT178-1506084

Project ID:	Vacant Land
Project Name:	29508 Roadside, Agoura

Laboratory ID: Client Sample ID:	1506-084-2 B7-10	1506-084-5 B8-10	1506-084-9 B9-10	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3-Dichloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Dibromochloromethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Hexanone	ND	ND	ND	EPA 8260B	mg/Kg	0.01
Tetrachloroethene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,1,1,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Ethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
m.p-Xylene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
Bromoform	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Styrene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
o-Xylene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
1,1,2,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Isopropylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Chlorotoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
n-Propylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
4-Chlorotoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3,5-Trimethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
tert-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,4-Trimethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
sec-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,4-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
p-Isopropyltoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
n-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2 Dibromo-3-Chloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,4-Trichlorobenzene	ND	ND	NÐ	EPA 8260B	mg/Kg	0.005
Naphthalene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Hexachlorobutadiene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Ethanol	ND	ND	ND	EPA 8260B	mg/Kg	0.1

### ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SUI	Control Limit	
Dibromofluoromethane	88	86	95	70-130
1,2 Dichloromethaned4	102	123	120	70-130
Toluene-d8	96	103	102	70-130
Bromofluorobenzene	104	105	106	70-130

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507			
Project ID:	Vacant	Land					
Project Name:	29508 F	Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:		5 @ 09:30 am 5 @ 08:15 am 5			Matrix: Soil		
Laboratory ID:		1506-084-13	1506-084-16	1506-084-19	Method	Units:	Detection
Client Sample ID:		B10-10	B11-15	B12-15			Limit
Dilution		1	1	1			
Dichlorodifluorometha	ane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chloromethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Vinyl Chloride		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromomethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005 0.005
Chloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Trichlorofluoromethar	ne	ND	ND ND	ND ND	EPA 8260B EPA 8260B	mg/Kg mg/Kg	0.005
Iodomethane		ND ND	ND	ND	EPA 8260B	mg/Kg	0.005
Acetone		ND ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,1-Dichloroethene	`	ND	ND	ND	EPA 8260B	mg/Kg	0.02
t-Butyl Alcohol (TBA Methylene Chloride	)	ND	ND	ND	EPA 8260B	mg/Kg	0.02
Freon 113		ND	ND	ND	EPA 8260B	mg/Kg	0.01
Carbon disulfide		ND	ND	ND	EPA 8260B	mg/Kg	0.005
trans, 1, 2-Dichloroethe	ne	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Methyl-tert-butyl-ethe		ND	ND	ND	EPA 8260B	mg/Kg	0.002
1,1-Dichloroethane	(mbb)	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Vinyl acetate		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Diisopropyl Ether (DI	PE)	ND	ND	ND	EPA 8260B	mg/Kg	0.002
Methyl Ethyl Ketone		ND	ND	ND	EPA 8260B	mg/Kg	0.01
cis,1,2-Dichloroethen	e	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromochloromethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chloroform		ND	ND	ND	EPA 8260B	mg/Kg	0.005
2,2-Dichloropropane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Ethyl-t-butyl ether (E	FBE)	NĎ	NĎ	ND	EPA 8260B	mg/Kg	0.002
1,1,1-Trichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2-Dichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,1-Dichloropropene		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Carbon Tetrachloride		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Benzene	(m) + • •	ND	ND	ND	EPA 8260B	mg/Kg	0.001 0.002
t-Amyl Methyl Ether (	(TAM)	ND	ND	ND	EPA 8260B	mg/Kg	0.002
1,2-Dichloropropane		ND	ND ND	ND ND	EPA 8260B EPA 8260B	mg/Kg mg/Kg	0.005
Trichloroethene		ND ND	ND	ND	EPA 8260B	mg/Kg	0.005
Dibromomethane Bromodichloromethar	۱e	ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Chloroethylvinyleth		ND	ND	ND	EPA 8260B	mg/Kg	0.005
cis, 1,3-Dichloroprope		ND	ND	ND	EPA 8260B	mg/Kg	0.005
4-Methyl-2-pentanone		ND	ND	ND	EPA 8260B	mg/Kg	0.01
trans, 1, 3-Dichloropro		ND	ND	ND	EPA 8260B	mg/Kg	0.005
Toluene	r ••	ND	ND	ND	EPA 8260B	mg/Kg	0.001
1,1,2-Trichloroethane		ND	ND	ND	EPA 8260B	mg/Kg	0.005
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# CTEL Project No: CT178-1506084

Project ID:	Vacant Land
Project Name:	29508 Roadside, Agoura

Laboratory ID: Client Sample ID:	1506-084-13 B10-10	1506-084-16 B11-15	1506-084-19 B12-15	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3-Dichloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Dibromochloromethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Hexanone	ND	ND	ND	EPA 8260B	mg/Kg	0.01
Tetrachloroethene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Chlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,1,1,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Ethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
m.p-Xylene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
Bromoform	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Styrene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
o-Xylene	ND	ND	ND	EPA 8260B	mg/Kg	0.001
1,1,2,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Isopropylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Bromobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
2-Chlorotoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
n-Propylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
4-Chlorotoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3,5-Trimethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
tert-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,4-Trimethylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
sec-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,3-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,4-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
p-Isopropyltoluene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2-Dichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
n-Butylbenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2 Dibromo-3-Chloropropane	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,4-Trichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Naphthalene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichlorobenzene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Hexachlorobutadiene	ND	ND	ND	EPA 8260B	mg/Kg	0.005
Ethanol	ND	ND	ND	EPA 8260B	mg/Kg	0.1

### ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SUI	Control Limit	
Dibromofluoromethane	87	86	94	70-130
1,2 Dichloromethaned4	117	104	119	70-130
Toluene-d8	93	98	104	70-130
Bromofluorobenzene	114	112	115	70-130

CTEL Project No: Client Name:	Hillmar 1745 W Orange,	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507			
Attention:	Mr. Dai	n Louks / Brando	n Clements					
Project ID:	Vacant	Land						
Project Name:	29508 F	Roadside, Agoura						
Date Sampled: Date Received: Date Analyzed:		5 @ 09:30 am 5 @ 08:15 am 5			Matrix: Soil			
Laboratory ID:		1506-084-20	1506-084-24		Method	Units:	Detection	
Client Sample ID:		B13-15	B14-15				Limit	
Dilution		1	1					
Dichlorodifluorometha	nne	ND	ND		EPA 8260B	mg/Kg	0.005	
Chloromethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Vinyl Chloride		ND	ND		EPA 8260B	mg/Kg	0.005	
Bromomethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Chloroethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Trichlorofluoromethan	e	ND	ND		EPA 8260B	mg/Kg	0.005	
Iodomethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Acetone		ND	ND		EPA 8260B	mg/Kg	0.005	
1,1-Dichloroethene		ND	ND		EPA 8260B	mg/Kg	0.005	
t-Butyl Alcohol (TBA)	)	ND	ND		EPA 8260B	mg/Kg	0.02	
Methylene Chloride		ND	ND		EPA 8260B	mg/Kg	0.02	
Freon 113		ND	ND		EPA 8260B	mg/Kg	0.01	
Carbon disulfide		ND	ND		EPA 8260B	mg/Kg	0.005	
trans, 1, 2-Dichloroethe		ND	ND		EPA 8260B	mg/Kg	0.005	
Methyl-tert-butyl-ether	r(MtBE)	ND	ND		EPA 8260B	mg/Kg	0.002	
1,1-Dichloroethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Vinyl acetate	DE)	ND	ND		EPA 8260B	mg/Kg	0.005	
Diisopropyl Ether (DII	PE)	ND	ND		EPA 8260B	mg/Kg	0.002	
Methyl Ethyl Ketone cis,1,2-Dichloroethene		ND ND	ND		EPA 8260B	mg/Kg	0.01	
Bromochloromethane	:	ND ND	ND ND		EPA 8260B	mg/Kg	0.005	
Chloroform		ND	ND		EPA 8260B EPA 8260B	mg/Kg	0.005	
2,2-Dichloropropane		ND	ND		EPA 8260B	mg/Kg mg/Kg	0.005 0.005	
Ethyl-t-butyl ether (ET	BE)	ND	ND		EPA 8260B	mg/Kg	0.003	
1,1,1-Trichloroethane	<i>BL</i> )	ND	ND		EPA 8260B	mg/Kg	0.002	
1,2-Dichloroethane		ND	ND		EPA 8260B	mg/Kg	0.005	
1,1-Dichloropropene		ND	ND		EPA 8260B	mg/Kg	0.005	
Carbon Tetrachloride		ND	ND		EPA 8260B	mg/Kg	0.005	
Benzene		ND	ND		EPA 8260B	mg/Kg	0.001	
t-Amyl Methyl Ether (	TAM)	ND	ND		EPA 8260B	mg/Kg	0.002	
1,2-Dichloropropane		ND	ND		EPA 8260B	mg/Kg	0.005	
Trichloroethene		ND	ND		EPA 8260B	mg/Kg	0.005	
Dibromomethane		ND	ND		EPA 8260B	mg/Kg	0.005	
Bromodichloromethan		ND	ND		EPA 8260B	mg/Kg	0.005	
2-Chloroethylvinylethe		ND	ND		EPA 8260B	mg/Kg	0.005	
cis,1,3-Dichloroproper		ND	ND		EPA 8260B	mg/Kg	0.005	
4-Methyl-2-pentanone		ND	ND		EPA 8260B	mg/Kg	0.01	
trans, 1, 3-Dichloroprop	ene	ND	ND		EPA 8260B	mg/Kg	0.005	
Toluene		ND	ND		EPA 8260B	mg/Kg	0.001	
1,1,2-Trichloroethane		ND	ND		EPA 8260B	mg/Kg	0.005	

Project ID:	Vacant Land
Project Name:	29508 Roadside, Agoura

Laboratory ID: Client Sample ID:	1506-084-20 B13-15	1506-084-24 B14-15	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	EPA 8260B	mg/Kg	0.005
1,3-Dichloropropane	ND	ND	EPA 8260B	mg/Kg	0.005
Dibromochloromethane	ND	ND	EPA 8260B	mg/Kg	0.005
2-Hexanone	ND	ND	EPA 8260B	mg/Kg	0.01
Tetrachloroethene	ND	ND	EPA 8260B	mg/Kg	0.005
Chlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
1,1,1,2-Tetrachloroethane	ND	ND	EPA 8260B	mg/Kg	0.005
Ethylbenzene	ND	ND	EPA 8260B	mg/Kg	0.001
m.p-Xylene	ND	ND	EPA 8260B	mg/Kg	0.001
Bromoform	ND	ND	EPA 8260B	mg/Kg	0.005
Styrene	ND	ND	EPA 8260B	mg/Kg	0.005
o-Xylene	ND	ND	EPA 8260B	mg/Kg	0.001
1,1,2,2-Tetrachloroethane	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichloropropane	ND	ND	EPA 8260B	mg/Kg	0.005
Isopropylbenzene	ND	NĎ	EPA 8260B	mg/Kg	0.005
Bromobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
2-Chlorotoluene	ND	ND	EPA 8260B	mg/Kg	0.005
n-Propylbenzene	ND	ND	EPA 8260B	mg/Kg	0.005
4-Chlorotoluene	ND	ND	EPA 8260B	mg/Kg	0.005
1,3,5-Trimethylbenzene	ND	ND	EPA 8260B	mg/Kg	0.005
tert-Butylbenzene	ND	NĎ	EPA 8260B	mg/Kg	0.005
1,2,4-Trimethylbenzene	ND	ND	EPA 8260B	mg/Kg	0.005
sec-Butylbenzene	ND	ND	EPA 8260B	mg/Kg	0.005
1.3-Dichlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
1.4-Dichlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
p-Isopropyltoluene	ND	ND	EPA 8260B	mg/Kg	0.005
1,2-Dichlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
n-Butylbenzene	ND	ND	EPA 8260B	mg/Kg	0.005
1.2 Dibromo-3-Chloropropane	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,4-Trichlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
Naphthalene	ND	ND	EPA 8260B	mg/Kg	0.005
1,2,3-Trichlorobenzene	ND	ND	EPA 8260B	mg/Kg	0.005
Hexachlorobutadiene	ND	ND	EPA 8260B	mg/Kg	0.005
Ethanol	ND	ND	EPA 8260B	mg/Kg	0.1

ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SURROGATE RECOVERY	Control Limit
Dibromofluoromethane	93	88	70-130
1,2 Dichloromethaned4	116	104	70-130
Toluene-d8	108	109	70-130
Bromofluorobenzene	109	97	70-130

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507		
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/12/15 – 06/15/15		Matrix: Solid			
Laboratory ID: Client Sample ID: Dilution	1506-084-1 B7-5 1	1506-084-4 B8-5 1	1506-084-8 B9-5 1	Method	Units	Detection Limit
Carbon Chain (C5~C Carbon Chain (C13~C Carbon Chain (C25~C	C24) ND	ND ND ND	ND ND ND	EPA 8015M EPA 8015M EPA 8015M	mg/Kg mg/Kg mg/Kg	0.1 1 5

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507		
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/12/15 – 06/15/15		Matrix: Solid			
Laboratory ID: Client Sample ID: Dilution	1506-084-9 B9-10 I	1506-084-12 B10-5 l	1506-084-13 B10-10 I	Method	Units	Detection Limit
Carbon Chain (C5~C) Carbon Chain (C13~C) Carbon Chain (C25~C)	C24) ND	ND ND ND	ND ND ND	EPA 8015M EPA 8015M EPA 8015M	mg/Kg mg/Kg mg/Kg	0.1 1 5

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507		
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/12/15 – 06/15/15		Matrix: Solid			
Laboratory ID: Client Sample ID: Dilution	1506-084-16 B11-15 1	1506-084-17 B11-20 I	1506-084-18 B12-10 1	Method	Units	Detection Limit
Carbon Chain (C5~C12)NDCarbon Chain (C13~C24)NDCarbon Chain (C25~C40)ND		ND ND ND	ND ND ND	EPA 8015M EPA 8015M EPA 8015M	mg/Kg mg/Kg mg/Kg	0.1 1 5

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone Fax:	e:(714) 206-3 (714) 634-9	
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/12/15 – 06/15/15		Matrix: Solid			
Laboratory ID: Client Sample ID: Dilution	1506-084-19 B12-15 I	1506-084-20 B13-15 1	1506-084-21 B13-20 I	Method	Units	Detection Limit
Carbon Chain (C5~C Carbon Chain (C13~C Carbon Chain (C25~C	224) ND	ND ND ND	ND ND ND	EPA 8015M EPA 8015M EPA 8015M	mg/Kg mg/Kg mg/Kg	0.1 1 5

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave. Orange, CA 92868 Mr. Dan Louks / Brandon Clements			Phone:(714) 206-3916 Fax: (714) 634-9507			
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura	L					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/12/15 – 06/15/15			Matrix: Solid			
Laboratory ID: Client Sample ID: Dilution	1506-084-24 B14-15 1	1506-084-25 B14-20 1	1506-084-26 B12-6 1	Method	Units	Detection Limit	
Carbon Chain (C5~C) Carbon Chain (C13~C Carbon Chain (C25~C	224) ND	ND ND ND	ND ND ND	EPA 8015M EPA 8015M EPA 8015M	mg/Kg mg/Kg mg/Kg	0.1 1 5	

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Ave Orange, CA 92868 Mr. Dan Louks / Brandon	Iillman ConsultingPhone: (714) 206-391745 W. Orangewood Ave.Phone: (714) 206-391				
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/16/15		Matrix: Solid			
Laboratory ID: Client Sample ID:	1506-084-1 B7-5	1506-084-4 B8-5	1506-084-8 B9-5	Method	Units	Detection Limit
Title 22 Metals, So	lid					
Antimony (Sb)	ND	ND	ND	SW846 6010B	mg/Kg	1
Arsenic (As)	6.0	9.9	2.5	SW846 6010B	mg/Kg	1
Barium (Ba)	130	110	77	SW846 6010B	mg/Kg	0.5
Beryllium (Be)	ND	ND	ND	SW846 6010B	mg/Kg	1
Cadmium (Cd)	5.9	6.2	ND	SW846 6010B	mg/Kg	1
Chromium (Cr)	47	38	45	SW846 6010B	mg/Kg	1
Cobalt (Co)	18	14	20	SW846 6010B	mg/Kg	1
Copper (Cu)	28	27	20	SW846 6010B	mg/Kg	1
Lead (Pb)	4.8	7.0	2.3	SW846 6010B	mg/Kg	1
Mercury (Hg)	ND	ND	ND	SW846 7471	mg/Kg	0.05
Molybdenum (Mo)	ND	ND	ND	SW846 6010B	mg/Kg	1
Nickel (Ni)	56	43	50	SW846 6010B	mg/Kg	1
Selenium (Se)	ND	ND	ND	SW846 6010B	mg/Kg	1
Silver (Ag)	ND	ND	ND	SW846 6010B	mg/Kg	1
Thallium (Tl)	ND	NĎ	ND	SW846 6010B	mg/Kg	1
Vanadium (V)	68	65	42	SW846 6010B	mg/Kg	1
Zinc (Zn)	71	75	39	SW846 6010B	mg/Kg	1
Acid, Extraction	06/12/15	06/12/15	06/12/15	SW846 3050	Date	

ND = Not Detected at the indicated Detection Limit

CTEL Project No: Client Name: Attention:	CT178-1506084 Hillman Consulting 1745 W. Orangewood Av Orange, CA 92868 Mr. Dan Louks / Brandon			Phone:(714) 206-39 Fax: (714) 634-95			
Project ID: Project Name:	Vacant Land 29508 Roadside, Agoura						
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 09:30 am 06/12/15 @ 08:15 am 06/16/15		Matrix: Solid				
Laboratory ID: Client Sample ID:	1506-084-12 B10-5	1506-084-16 B11-15	1506-084-19 B12-15	Method	Units	Detection Limit	
Title 22 Metals, Sol	lid						
Antimony (Sb)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Arsenic (As)	8.5	3.2	ND	SW846 6010B	mg/Kg	1	
Barium (Ba)	110	78	57	SW846 6010B	mg/Kg	0.5	
Beryllium (Be)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Cadmium (Cd)	7.6	34	1.8	SW846 6010B	mg/Kg	1	
Chromium (Cr)	27	2.1	12	SW846 6010B	mg/Kg	1	
Cobalt (Co)	12	2.4	8.3	SW846 6010B	mg/Kg	1	
Copper (Cu)	30	5.5	12	SW846 6010B	mg/Kg	1	
Lead (Pb)	11	1.4	2.0	SW846 6010B	mg/Kg	1	
Mercury (Hg)	ND	ND	ND	SW846 7471	mg/Kg	0.05	
Molybdenum (Mo)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Nickel (Ni)	49	8.5	15	SW846 6010B	mg/Kg	1	
Selenium (Se)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Silver (Ag)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Thallium (Tl)	ND	ND	ND	SW846 6010B	mg/Kg	1	
Vanadium (V)	53	12	21	SW846 6010B	mg/Kg	1	
Zinc (Zn)	92	16	17	SW846 6010B	mg/Kg	1	
Acid, Extraction	06/12/15	06/12/15	06/12/15	SW846 3050	Date		

ND = Not Detected at the indicated Detection Limit

Roobik Yaghoabi

Laboratory Director

\*The results are base upon the sample received.

Cal Tech Environmental Laboratories, Inc. ELAP ID #: 2424

6814 Rosecrans Avenue,Paramount, CA 90723-3146Telephone: (562) 272-2700Fax: (562) 272-2789

# QA/QC Report

Method:	8015M	Client:	Hillman
Matrix:	Soil	Project: Batch No:	06-084 A50612
Date Analyzed:	6/12/2015	Inst. ID	MSD #1
Date Extracted:	6/12/2015	Lab QC Sampie ID:	06-085-01

Perimeters	Conc.	ug/Kg	Spike	Recovery %		Control	Limits	RPD
	MS	MSD	Added	MS	MSD	Rec.	RPD	
TPH - Gasoline	1013	1068	1000	101	107	70-130	30	6
TPH - Diesel	1097	1134	1000	110	113	70-130	30	3

Perimeters	Method Blank	Units	Det. Limit
TPH - Gasoline	ND	ug/Kg	100
TPH - Diesel	ND	ug/Kg	1000

MS: Matrix Spike MSD: Matrix Spike Duplicate



 6814 Rosecrans Avenue,
 Paramount, CA 90723-3146

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 Fax: (562) 272-2789

# QA/QC Report

Method:	8260B	Client:	Hillman
Matrix:	Soil	Project: Batch No:	06-084 A50612
Date Analyzed:	6/12/2015	Inst. ID	MSD #1
Date Extracted:	6/12/2015	Lab QC Sample ID:	06-085-01

Perimeters	Conc.	ug/Kg	Spike	Recovery	%	Control	Limits	RPD
	MS	MSD	Added	MS	MSD	Rec.	RPD	
1,1-Dichloroethene	41	42	50	82	84	60-140	30	2
Benzene	46	49	50	92	98	60-140	30	6
Trichloroethene	41	42	50	82	84	60-140	30	2
Toluene	46	47	50	92	94	60-140	30	2
Chlorobenzene	51	50	50	102	100	60-140	30	2
m,p-Xylenes	99	100	100	99	100	60-140	30	1

MS: Matrix Spike MSD: Matrix Spike Duplicate

Perimeters	Method	Units	Det.
	Blank		Limit
1,1-Dichloroethene	ND	ug/Kg	5
Benzene	ND	ug/Kg	5
Trichloroethene	ND	ug/Kg	5
Toluene	ND	ug/Kg	5
Chlorobenzene	ND	ug/Kg	5
m,p-Xylenes	ND	ug/Kg	5
MTBE	ND	ug/Kg	5
ТВА	ND	ug/Kg	100
DIPE	ND	ug/Kg	10
ETBE	ND	ug/Kg	10
TAME	ND	ug/Kg	10
1,2-Dichloroethane	ND	ug/Kg	5
EDB	ND	ug/Kg	5
Ethylbenzene	ND	ug/Kg	5
o-Xylene	ND	ug/Kg	5



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# QA/QC Report

Method:	6010B/7471	Client:	Hillman
Matrix:	Soil	Project: Batch No:	06-084 500616
Date Analyzed:	6/16/2015	Inst. ID	DV3300
Units:	mg/kg	Lab QC Sample ID:	06-082-13

Perimeters	Method	LCS	LCSD	Spike	LCS %	LCSD %	Limits	RPD
	Blank			Added	Rec.	Rec.		
Arsenic	0	1.02	0.997	1	102	100	70-130	2
Cadmium	0	0.872	0.903	1	87	90	70-130	3
Chromium	0	1.02	1.04	1	102	104	70-130	2
Copper	0	0.94	0.981	1	94	98	70-130	4
Lead	0	0.97	1.01	1	97	101	70-130	4
Mercury	0	0.135	0.142	0.15	90	95	70-130	5
Selenium	0	0.991	0.957	1	99	96	70-130	3
Silver	0	0.47	0.462	0.5	94	92	70-130	2
Zinc	0	1.03	1.01	1	103	101	70-130	2

LCS: Laboratory Control Standard

LCSD: Laboratory Control Standard Duplicate

Lab Job No. 06. 5304 Page Zof 2	Chain of Custody Record	Phone: $(\mathcal{P}\mathcal{A})206^{-3}\mathcal{A}\mathcal{L}$ Turn Around Time				Analyses Requested			pe No. Preserv. Matrix AV SV V Comments	1.2 212 E	R X	XX					×			Date / Time: 6/12/15 8: 15 Received:	Date / Time:		Date / Time: 6-12-15 4:15 Received by lab: Received by lab:	Custody seal(s) in tact upon receipt by lab? YES NO NONE
<mark>al L.aboratories</mark> unt, CA 90723-3146 Fax: (562) 272-2789				Pue., 576 110		29508 Renderving gearen			Date/Time Sampled Bottle Type	6/11 115 11:40 SSIENDAR	12:05	12:10	12.20	12:35	13:20	13.75	14:75	04:41	V 15:30 V			ove indicated tests.		
CAL TECH Environmental Laboratories 6814 Rosecrans Avenue, Paramount, CA 90723-3146 Telephone: (562) 272-2700 Fax: (562) 272-2789	>	Client BLADDA CLEMEND	Contact N HILL man	RAVE WOOD	Oftentit, CA	Project: UPCANT LAND - 29,508	OAN Lover Jok	a line of grants	Lab ID Number Field ID	06.024-11 35-20	12 810-5	12 810-10	1 810 - 15	15 810-20	15 611 - 15	02-118 []	19812-10	19 812-15	20 B13- 15	Relinquished:	Dispatched :	I hereby authorize the performance of the above indicated tests.		C'TELCCR.DOC

nental Laboratories <sup>aramount,</sup> CA 90723-3146 0 Fax: (562) 272-2789	Phone: (714)206-3111	ACCUDON MC, STE 110 Fax: Rush Normal Normal	Lonsine, Abaup	Id ID Date/Fime Sampled Bottle Type No. Preserv. Matrix	6/11/12	25 IL:10		2 V 17:50 V V V X V		futer Date/Time: 6/12/15 8:15 Received:	Date / Time: Carrier:	Ince of the above indicated tests. Date / Time: $6 - (L - (r / b) + (r - Received hv lah) Received hv lah$
<b>AL TECH Environmental Laboratories</b> 6814 Rosecrans Avenue, Paramount, CA 90723-3146 Telephone: (562) 272-2700 Fax: (562) 272-2789		M) ELOO PLE,	Project: UNCAPT LAN - 29508 Londsing. Sampled By: DAPY Lond KS - Rula	Lab ID Number Field ID Date/Time S	B13-20 6/11/15	22 B13-25 23 B13-30	24 614-15 1	25 B12-6		Relinquished De Junter	Dispatched :	I hereby authorize the performance of the above indicated tests.



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 Paramount, CA 90723-3146

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 Fax: (562) 272-2789

### **ANALYTICAL RESULTS\***

CTEL Project No: Client Name: Attention:	Hillman 1745 W. Orange,	1506083 Consulting Orangewood A CA 92868 Louks / Brando			Phone:(714) 206-3916 Fax: (714) 634-9507						
Project ID:	Vacant I	and									
Project Name:		oadside, Agoura									
i toject Name.	2)500 R	odusiue, Agoura	L								
Date Sampled: Date Received: Date Analyzed:		5 @ 18:10 pm 5 @ 08:15 am 5			Matrix: Wa	ter					
Laboratory ID: Client Sample ID:		1506-083-1 B7-W	1506-083-2 B10-W		Method	Units:	Detection Limit				
Dilution		1	1								
D'abless d'Assessed					FD4 93/0D						
Dichlorodifluorometha	ane	ND ND	ND ND		EPA 8260B	ug/L	1				
Chloromethane		ND	ND		EPA 8260B	ug/L	0.5				
Vinyl Chloride Bromomethane		ND	ND		EPA 8260B EPA 8260B	ug/L	1				
Chloroethane		ND	ND		EPA 8260B	ug/L ug/L	1				
Trichlorofluorometha	ne	ND	ND		EPA 8260B	ug/L	1				
Iodomethane		ND	ND		EPA 8260B	ug/L ug/L	1				
Acetone		ND	ND		EPA 8260B	ug/L	10				
1,1-Dichloroethene		ND	ND		EPA 8260B	ug/L	10				
t-Butyl Alcohol (TBA	)	ND	ND		EPA 8260B	ug/L	10				
Methylene Chloride	·)	ND	ND		EPA 8260B	ug/L	10				
Freon 113		ND	ND		EPA 8260B	ug/L	5				
Carbon disulfide		ND	ND		EPA 8260B	ug/L	1				
trans,1,2-Dichloroethe	ene	ND	ND		EPA 8260B	ug/L	1				
Methyl-tert-butyl-ethe		ND	ND		EPA 8260B	ug/L	1				
1,1-Dichloroethane	. ,	ND	ND		EPA 8260B	ug/L	1				
Vinyl acetate		ND	ND		EPA 8260B	ug/L	50				
Diisopropyl Ether (DI	PE)	ND	ND		EPA 8260B	ug/L	1				
Methyl Ethyl Ketone		ND	ND		EPA 8260B	ug/L	10				
cis, 1, 2-Dichloroethen	e	ND	ND		EPA 8260B	ug/L	1				
Bromochloromethane		ND	ND		EPA 8260B	ug/L	1				
Chloroform		ND	ND		EPA 8260B	ug/L	1				
2,2-Dichloropropane		ND	ND		EPA 8260B	ug/L	1				
Ethyl-t-butyl ether (El	/	ND	ND		EPA 8260B	ug/L	1				
1,1,1-Trichloroethane		ND	ND		EPA 8260B	ug/L	1				
1,2-Dichloroethane		ND	ND		EPA 8260B	ug/L	0.5				
1,1-Dichloropropene		ND	ND		EPA 8260B	ug/L	1				
Carbon Tetrachloride		ND	ND		EPA 8260B	ug/L	0.5				
Benzene	(TANA)	9.8	4.5		EPA 8260B	ug/L	0.5				
t-Amyl Methyl Ether ( 1,2-Dichloropropane	(IAM)	ND ND	ND ND		EPA 8260B EPA 8260B	ug/L	1				
Trichloroethene		ND	ND		EPA 8260B	ug/L ug/L	1				
Dibromomethane		ND	ND		EPA 8260B	ug/L	1				
Bromodichloromethan	ne	ND	ND		EPA 8260B	ug/L	1				
2-Chloroethylvinyleth		ND	ND		EPA 8260B	ug/L	5				
cis, 1,3-Dichloroprope		ND	ND		EPA 8260B	ug/L	1				
4-Methyl-2-pentanone		ND	ND		EPA 8260B	ug/L	10				
trans, 1, 3-Dichloroproj		ND	ND		EPA 8260B	ug/L	1				
Toluene	•	57	28		EPA 8260B	ug/L	0.5				
1,1,2-Trichloroethane		ND	ND		EPA 8260B	ug/L	1				
(Continued)						_					
. ,		TOTALLY	NEDICATED T	O CUSTOMER 9	ς ΑΤΓΩΈΛ (ΓΤΙ	ON					

TOTALLY DEDICATED TO CUSTOMER SATISFACTION

Project ID:	Vacant Land
Project Name:	29508 Roadside, Agoura

Laboratory ID: Client Sample ID:	1506-083-1 B7-W	1506-083-2 B10-W	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	EPA 8260B	. /1	
1,3-Dichloropropane	ND	ND	EPA 8260B	ug/L	0.5
Dibromochloromethane	ND	ND	EPA 8260B	ug/L	1
2-Hexanone	ND	ND	EPA 8260B	ug/L	1
Tetrachloroethene	ND	ND	EPA 8260B	ug/L	10
Chlorobenzene	ND	ND	EPA 8260B	ug/L	1
1,1,1,2-Tetrachloroethane	ND	ND	EPA 8260B	ug/L	1
Ethylbenzene	6.2	2.5	EPA 8260B	ug/L	1
m.p-Xylene	44	19	EPA 8260B	ug/L	0.5
Bromoform	ND	ND	EPA 8260B	ug/L	0.5
Styrene	ND	ND	EPA 8260B	ug/L ug/I	]
o-Xylene	18	7.9	EPA 8260B	ug/L	1
1,1,2,2-Tetrachloroethane	ND	ND	EPA 8260B	ug/L	0.5
1,2,3-Trichloropropane	ND	ND	EPA 8260B	ug/L	1
Isopropylbenzene	ND	ND	EPA 8260B	ug/L	1
Bromobenzene	ND	ND	EPA 8260B	ug/L	1
2-Chlorotoluene	ND	ND	EPA 8260B	ug/L	1
n-Propylbenzene	ND	ND	EPA 8260B	ug/L	1
4-Chlorotoluene	ND	ND	EPA 8260B	ug/L ug/L	1
1,3,5-Trimethylbenzene	5.1	2.6	EPA 8260B	ug/L ug/L	1
tert-Butylbenzene	ND	ND	EPA 8260B	ug/L ug/L	1
1,2,4-Trimethylbenzene	8.1	4.1	EPA 8260B	ug/L ug/L	1
sec-Butylbenzene	ND	ND	EPA 8260B		1
1,3-Dichlorobenzene	ND	ND	EPA 8260B	ug/L	1
1,4-Dichlorobenzene	ND	ND	EPA 8260B	ug/L	1
p-Isopropyltoluene	ND	ND	EPA 8260B	ug/L ug/L	1
1,2-Dichlorobenzene	ND	ND	EPA 8260B		1
n-Butylbenzene	ND	ND	EPA 8260B	ug/L	1
1,2 Dibromo-3-Chloropropane	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trichlorobenzene	ND	ND	EPA 8260B	ug/L	1
Naphthalene	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichlorobenzene	ND	ND	EFA 8200B EPA 8260B	ug/L	1
Hexachlorobutadiene	ND	ND	EPA 8260B EPA 8260B	ug/L	1
Ethanol	ND	ND	EPA 8260B EPA 8260B	ug/L	1
			EFA 6200B	ug/L	50

### ND = Not Detected at the indicated Detection Limit

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SURROGATE SPIKE		% SURROGATE RECOVERY	Control Limit
Dibromofluoromethane	85	96	70-130
1,2 Dichloromethaned4	84	87	70-130
Toluene-d8	80	80	70-130
Bromofluorobenzene	86	97	70-130

CTEL Project No: Client Name: Attention:	CT178-1506083 Hillman Consulting 1745 W. Orangewood A Orange, CA 92868 Mr. Dan Louks / Brande			Phone:(714) 206-3916 Fax: (714) 634-9507			
Project ID: Project Name:	Vacant Land 29508 Roadside, Agour	a					
Date Sampled: Date Received: Date Analyzed:	06/11/15 @ 18:10 pm 06/12/15 @ 08:15 am 06/16/15		Matrix	: Water			
Laboratory ID: Client Sample ID:	1506-083-1 B7-W	1506-083-2 B10-W	Method	Units	Detection Limit		
Title 22 Metals, So	lid						
Antimony (Sb)	ND	ND	SW846 6010B	mg/L	0.01		
Arsenic (As)	0.131	ND	SW846 6010B	mg/L	0.01		
Barium (Ba)	0.013	0.025	SW846 6010B	mg/L	0.005		
Beryllium (Be)	ND	ND	SW846 6010B	mg/L	0.01		
Cadmium (Cd)	0.160	ND	SW846 6010B	mg/L	0.01		
Chromium (Cr)	0.501	0.020	SW846 6010B	mg/L	0.01		
Cobalt (Co)	0.213	ND	SW846 6010B	mg/L	0.01		
Copper (Cu)	0.586	ND	SW846 6010B	mg/L	0.01		
Lead (Pb)	0.089	ND	SW846 6010B	mg/L	0.01		
Mercury (Hg)	ND	ND	SW846 7470	mg/L	0.0002		
Molybdenum (Mo)	ND	ND	SW846 6010B	mg/L	0.01		
Nickel (Ni)	0.710	0.018	SW846 6010B	mg/L	0.01		
Selenium (Se)	ND	ND	SW846 6010B	mg/L	0.01		
Silver (Ag)	ND	ND	SW846 6010B	mg/L	0.01		
Thallium (Tl)	ND	ND	SW846 6010B	mg/L	0.01		
Vanadium (V)	0.917	ND	SW846 6010B	mg/L	0.01		
Zinc (Zn)	1.32	0.043	SW846 6010B	mg/L	0.01		
Acid, Extraction	06/12/15	06/21/15	SW846 3051	Date			

ND = Not Detected at the indicated Detection Limit

Laboratory Director

\*The results are base upon the sample received.

Cal Tech Environmental Laboratories, Inc. ELAP ID #: 2424



 6814 Rosecrans Avenue,
 Paramount, CA 90723-3146

 Telephone: (562) 272-2700
 Fax: (562) 272-2789

# QA/QC Report

Method:	8260B	Client:	Hillman
Matrix:	Water	Project: Batch No:	06-083 B50612
Date Analyzed:	6/12/2015	Inst. ID	MSD #2
Date Extracted:	6/12/2015	Lab QC Sample ID:	06-090-01

Perimeters	Conc.	ug/L	Spike	Recovery	%	Control	Limits	RPD
	MS	MSD	Added	MS	MSD	Rec.	RPD	
1,1-Dichloroethene	54	53	50	108	106	60-140	30	2
Benzene	47	49	50	94	98	60-140	30	4
Trichloroethene	51	45	50	102	90	60-140	30	12
Toluene	52	46	50	104	92	60-140	30	12
Chlorobenzene	46	43	50	92	86	60-140	30	6
m,p-Xylenes	109	98	100	109	98	60-140	30	11

MS: Matrix Spike MSD: Matrix Spike Duplicate

Perimeters	Method	Units	Det.
	Blank		Limit
1,1-Dichloroethene	ND	ug/L	1
Benzene	ND	ug/L	0.5
Trichloroethene	ND	ug/L	0.5
Toluene	ND	ug/L	0.5
Chlorobenzene	ND	ug/L	0.5
m,p-Xylenes	ND	ug/L	0.6
MTBE	ND	ug/L	1
ТВА	ND	ug/L	10
DIPE	ND	ug/L	1
ETBE	ND	ug/L	1
TAME	ND	ug/L	1
1,2-Dichloroethane	ND	ug/L	0.5
EDB	ND	ug/L	0.5
Ethylbenzene	ND	ug/L	0.5
o-Xylene	ND	ug/L	0.6
TCE	ND	ug/L	1
PCE	ND	ug/L	1

 6814 Rosecrans Avenue,
 Paramount, CA 90723-3146

 Telephone: (562) 272-2700
 Fax: (562) 272-2789

# QA/QC Report

Method:	6010B/7470
iniocitoo.	00100//4/0

Matrix: AQ

Date Analyzed: 6/16/2015

Units: mg/L

Perimeters	Method	LCS	LCSD	Spike	LCS %	LCSD %	Limits	RPD
	Blank			Added	Rec.	Rec.		
Arsenic	0	0.804	0.817	1	80	82	70-130	2
Cadmium	0	0.854	0.839	1	85	84	70-130	1
Chromium	0	0.831	0.835	1	83	84	70-130	1
Copper	0	0.903	0.877	1	90	88	70-130	2
Lead	Ō	0.872	0.861	1	87	86	70-130	1
Mercury	0	0.122	0.117	0.15	81	78	70-130	3
Selenium	0	0.806	0.826	1	81	83	70-130	2
Silver	0	0.462	0.442	0.5	92	88	70-130	4
Zinc	0	0.922	0.927	1	93	93	70-130	0

LCS: Laboratory Control Standard

LCSD: Laboratory Control Standard Duplicate

CAL TECH Environm 6814 Rosecrans Avenue, Pai Telephone: (562) 272-2700	ent:	al Laboratories unt, CA 90723-3146 Fax: (562) 272-2789			-	Lab Job No	6-043	Page 1 of 1	
>							in of Custo	<b>Chain of Custody Record</b>	
Client: HI	HILMAN CONSUMME	אונ	ة ا	None: (HY	Phone: (HY) 206-3716		Turn Around Time		
Contact: BLA	BLANDN LIEMENT		4	Fax:			Rush		
Address: 1740	1745 W. ORANGEWOOD ANEWE, STE 110	Artist, STE 110	ł				Normal		
040	OLANG, CA								
Project: VAC	VACANT I AND - 29508 ROMOSIDE.	ROMOSIDE, AGOUG	8				Analyses Requested		
Sampled By: 0.42	0,92 Loves 1, dg- take Name/Signature		1						
	0					40			
Lab ID Number	Field ID	Date/Time Sampted	Bottle Type	No. Preserv.	rv. Matrix	/ dr / Jac		Comments	
06 083-1	B7-W	6/11/5 18:10	VOA /POLY	3 24	3	XX			
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Relinquished	W-K. hu	Jr	Date	Date / Time: 8	8:15 6/12/13	uns	Received:		]
Dispatched :			Date	Date / Time:			Carrier:		
I hereby authorize t	I hereby authorize the performance of the above indicated tests.	ove indicated tests.							
			Date	Date / Time:	6-12-15	1 & :Ve-		- Received by lab: R. Joy	j
CTELCCR DOC			-	Custody seal(s	) in tact upon	Custody seal(s) in tact upon receipt by lab?	YES	NO NO	NONE



 6814 Rosecrans Avenue,
 Paramount, CA 90723-3146

 Telephone: (562) 272-2700
 Fax: (562) 272-2789

## **ANALYTICAL RESULTS\***

CTEL Project No: Client Name: Attention:	Hillman 1745 W Orange,	1506106 Consulting . Orangewood A CA 92868 a Louks / Brando			Phone:(714) 2 Fax: (714) 6		
Project ID:		Lours / Drahao					
-	20500 4		TT:11-				
Project Name:	29308 A	goura – Agoura	nills				
Date Sampled: Date Received: Date Analyzed:		5 @ 17:30 pm 5 @ 20:10 pm 5			Matrix: Air		
Laboratory ID:		1506-106-1	1506-106-2	1506-106-3	Method	Units:	Detection
Client Sample ID:		SG1-5	SG2-5	SG3-10			Limit
Dilution		1	1	1			
Dichlorodifluorometh	але	ND	ND	ND	EPA 8260B	ug/L	1
Chloromethane		ND	ND	ND	EPA 8260B	ug/L	1
Vinyl Chloride		ND	ND	ND	EPA 8260B	ug/L	0.5
Bromomethane		ND	ND	ND	EPA 8260B	ug/L	1
Chloroethane		ND	ND	ND	EPA 8260B	ug/L	1
Trichlorofluoromethar	ne	ND	ND	ND	EPA 8260B	ug/L	1
Iodomethane		ND	ND	ND	EPA 8260B	ug/L	1
Acetone		ND	ND	ND	EPA 8260B	ug/L	10
1,1-Dichloroethene		ND	ND	ND	EPA 8260B	ug/L	0.5
t-Butyl Alcohol (TBA	)	ND	ND	ND	EPA 8260B	ug/L	10
Methylene Chloride		ND	ND	ND	EPA 8260B	ug/L	10
Freon 113		ND	ND	ND	EPA 8260B	ug/L	5
Carbon disulfide		ND	ND	ND	EPA 8260B	ug/L	1
trans, 1,2-Dichloroethe	ene	ND	ND	ND	EPA 8260B	ug/L	0.5
Methyl-tert-butyl-ethe	r(MtBE)	ND	ND	ND	EPA 8260B	ug/L	1
1,1-Dichloroethane		ND	ND	ND	EPA 8260B	ug/L	0.5
Vinyl acetate		ND	ND	ND	EPA 8260B	ug/L	50
Diisopropyl Ether (DI	PE)	ND	ND	ND	EPA 8260B	ug/L	1
Methyl Ethyl Ketone		ND	ND	ND	EPA 8260B	ug/L	10
cis,1,2-Dichloroethene	•	ND	ND	ND	EPA 8260B	ug/L	0.5
Bromochloromethane		ND	ND	ND	EPA 8260B	ug/L	1
Chloroform		ND	ND	ND	EPA 8260B	ug/L	1
2,2-Dichloropropane		ND	ND	ND	EPA 8260B	ug/L	1
Ethyl-t-butyl ether (El	IBE)	ND	ND	ND	EPA 8260B	ug/L	1
1,1,1-Trichloroethane		ND	ND	ND	EPA 8260B	ug/L	1
1,2-Dichloroethane		ND	ND	ND	EPA 8260B	ug/L	0.5
1,1-Dichloropropene		ND	ND	ND	EPA 8260B	ug/L	1
Carbon Tetrachloride		ND	ND ND	ND	EPA 8260B	ug/L	0.5
Benzene	TANA)	ND ND	ND ND	ND	EPA 8260B EPA 8260B	ug/L	0.5
t-Amyl Methyl Ether (	I AM)	ND ND	ND	ND ND		ug/L	1
1,2-Dichloropropane Trichloroethene		ND	ND	ND	EPA 8260B EPA 8260B	ug/L	0.5
Dibromomethane		ND	ND	ND	EPA 8260B	ug/L	1
Bromodichloromethan	A	ND	ND	ND	EPA 8260B	ug/L ug/L	1
2-Chloroethylvinyleth		ND	ND	ND	EPA 8260B	ug/L	5
cis, 1, 3-Dichloroproper		ND	ND	ND	EPA 8260B	ug/L	3
4-Methyl-2-pentanone		ND	ND	ND	EPA 8260B		10
		ND	ND ND	ND	EPA 8260B EPA 8260B	ug/L	10
trans, 1, 3-Dichloroprop Toluene	Jene		ND ND	ND		ug/L	0.5
1,1,2-Trichloroethane		ND ND	ND	ND	EPA 8260B EPA 8260B	ug/L	0.5
(Continued)		ND	ND		LI A 0200D	ug/L	L
(Continued)		TOTALLY I	DEDICATED T	O CUSTOME	R SATISFACTIO	ON	

TOTALLY DEDICATED TO CUSTOMER SATISFACTION

### CTEL Project No: CT199-1506106

Project ID: Project Name: 29508 Agoura – Agoura Hills

Laboratory ID:	1506-106-1	1506-106-2	1506-106-3	Method	Units	Detection
Client Sample ID:	SG1-5	SG2-5	SG3-10			Limit
1,2-Dibromoethane(EDB)	ND	ND	ND	EPA 8260B	ug/L	0.5
1,3-Dichloropropane	ND	NÐ	ND	EPA 8260B	ug/L	1
Dibromochloromethane	ND	ND	ND	EPA 8260B	ug/L	1
2-Hexanone	ND	ND	ND	EPA 8260B	ug/L	10
Tetrachloroethene	ND	ND	ND	EPA 8260B	ug/L	0.5
Chlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,1,1,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	ug/L	1
Ethylbenzene	ND	ND	ND	EPA 8260B	ug/L	0.5
m.p-Xylene	ND	ND	ND	EPA 8260B	ug/L	0.5
Bromoform	ND	ND	ND	EPA 8260B	ug/L	1
Styrene	ND	ND	ND	EPA 8260B	ug/L	1
o-Xylene	ND	ND	ND	EPA 8260B	ug/L	0.5
1,1,2,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichloropropane	ND	ND	ND	EPA 8260B	ug/L	1
Isopropylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
Bromobenzene	ND	ND	ND	EPA 8260B	ug/L	1
2-Chlorotoluene	ND	ND	ND	EPA 8260B	ug/L	1
n-Propylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
4-Chlorotoluene	ND	ND	ND	EPA 8260B	ug/L	1
1,3,5-Trimethylbenzene	ND	ND	ND	EPA 8260B	ug/L	j
tert-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trimethylbenzene	ND	ND	ND	EPA 8260B	ug/L	i
sec-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,3-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,4-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
p-Isopropyltoluene	ND	ND	ND	EPA 8260B	ug/L	1
1,2-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
n-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,2 Dibromo-3-Chloropropane	ND	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
Naphthalene	ND	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
Hexachlorobutadiene	ND	ND	ND	EPA 8260B	ug/L	1
Ethanol	ND	ND	ND	EPA 8260B	ug/L	50

### ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SUI	ROGATE RECOVERY	Control Limit
Dibromofluoromethane	79	78	75	70-130
1,2 Dichloromethaned4	93	91	86	70-130
Toluene-d8	108	110	110	70-130
Bromofluorobenzene	103	109	104	70-130

CTEL Project No: Client Name:	Hillman Consulting 1745 W. Orangewood A Orange, CA 92868			Phone:(714) 2 Fax: (714) (		
Attention:	Mr. Dan Louks / Brando	on Clements				
Project ID:						
Project Name:	29508 Agoura – Agoura	ı Hills				
Date Sampled: Date Received: Date Analyzed:	06/15/15 @ 18:00 pm 06/15/15 @ 20:10 pm 06/16/15			Matrix: Air		
Laboratory ID: Client Sample ID: Dilution	1506-106-4 SG4-5 1	1506-106-5 SG5-10 1	1506-106-6 SG6-15 1	Method	Units:	Detection Limit
Dichlorodifluoromethan Chloromethane Vinyl Chloride Bromomethane	ie ND ND ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	1 1 0.5 1
Chloroethane Trichlorofluoromethane Iodomethane Acetone	ND ND ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L ug/L	1 1 1 10
1,1-Dichloroethene t-Butyl Alcohol (TBA) Methylene Chloride Freon 113	ND ND ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L ug/L	0.5 10 10 5
Carbon disulfide trans, 1,2-Dichloroethen Methyl-tert-butyl-ether( 1,1-Dichloroethane	MtBE) ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	1 0.5 1 0.5
Vinyl acetate Diisopropyl Ether (DIP Methyl Ethyl Ketone cis,1,2-Dichloroethene	ND ND	ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	50 1 10 0.5
Bromochloromethane Chloroform 2,2-Dichloropropane Ethyl-t-butyl ether (ETF		ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	1 1 1 1
1,1,1-Trichloroethane 1,2-Dichloroethane 1,1-Dichloropropene Carbon Tetrachloride	ND ND ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	1 0.5 1 0.5
Benzene t-Amyl Methyl Ether (T 1,2-Dichloropropane Trichloroethene	ND ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	0.5 1 1 0.5
Dibromomethane Bromodichloromethane 2-Chloroethylvinylether cis,1,3-Dichloropropene	ND	ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	1 1 5 1
4-Methyl-2-pentanone(1 trans,1,3-Dichloroprope Toluene 1,1,2-Trichloroethane (Continued)		ND ND ND ND	ND ND ND ND	EPA 8260B EPA 8260B EPA 8260B EPA 8260B	ug/L ug/L ug/L ug/L	10 1 0.5 1

### CTEL Project No: CT199-1506106

### Project ID: Project Name: 29508 Agoura – Agoura Hills

Laboratory ID: Client Sample ID:	1506-106-4 SG4-5	1506-106-5 SG5-10	1506-106-6 SG6-15	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	ND	EPA 8260B	ug/L	0.5
1,3-Dichloropropane	ND	ND	ND	EPA 8260B	ug/L	1
Dibromochloromethane	ND	ND	ND	EPA 8260B	ug/L	1
2-Hexanone	ND	ND	ND	EPA 8260B	ug/L	10
Tetrachloroethene	ND	ND	ND	EPA 8260B	ug/L	0.5
Chlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,1,1,2-Tetrachloroethane	ND	ND	ND	EPA 8260B	ug/L	1
Ethylbenzene	ND	ND	ND	EPA 8260B	ug/L	0.5
m.p-Xylene	ND	ND	ND	EPA 8260B	ug/L	0.5
Bromoform	ND	ND	ND	EPA 8260B	ug/L	1
Styrene	ND	ND	ND	EPA 8260B	ug/L	1
o-Xylene	ND	ND	ND	EPA 8260B	ug/L	0.5
1.1.2.2-Tetrachloroethane	ND	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichloropropane	ND	ND	ND	EPA 8260B	ug/L	1
Isopropylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
Bromobenzene	ND	ND	ND	EPA 8260B	ug/L	1
2-Chlorotoluene	ND	ND	ND	EPA 8260B	ug/L	1
n-Propylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
4-Chlorotoluene	ND	ND	ND	EPA 8260B	ug/L	1
1,3,5-Trimethylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
tert-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trimethylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
sec-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1.3-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,4-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
p-lsopropyltoluene	ND	ND	ND	EPA 8260B	ug/L	1
1,2-Dichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
n-Butylbenzene	ND	ND	ND	EPA 8260B	ug/L	1
1,2 Dibromo-3-Chloropropane	ND	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
Naphthalene	ND	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichlorobenzene	ND	ND	ND	EPA 8260B	ug/L	1
Hexachlorobutadiene	ND	ND	ND	EPA 8260B	ug/L	1
Ethanol	ND	ND	ND	EPA 8260B	ug/L	50

### ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SUF	ROGATE RECOVERY	Control Limit
Dibromofluoromethane	80	76	76	70-130
1.2 Dichloromethaned4	91	86	86	70-130
Toluene-d8	107	108	108	70-130
Bromofluorobenzene	104	104	109	70-130

CTEL Project No: Client Name: Attention:	CT178-1506106 Hillman Consulting 1745 W. Orangewood A Orange, CA 92868 Mr. Dan Louks / Brando		Phone:(714) Fax: (714)	206-3916 634-9507	
Attention;	MIT. Dan Louks / Brando	in Clements			
Project ID:					
Project Name:	29508 Agoura – Agoura	Hills			
Date Sampled:	06/15/15 @ 18:35 pm		Matrix: Air		
Date Received:	06/15/15 @ 20:10 pm				
Date Analyzed:	06/16/15				
Laboratory ID:	1506-106-7	1506-106-8	Method	Units:	Detection
<b>Client Sample ID:</b>	SG7-10	SG8-10		U MADI	Limit
Dilution	1	1			
Dichlorodifluorometha	ne ND	ND	EPA 8260B	ug/L	1
Chloromethane	ND	ND	EPA 8260B	ug/L	1
Vinyl Chloride	ND	ND	EPA 8260B	ug/L	0.5
Bromomethane	ND	ND	EPA 8260B	ug/L	1
Chloroethane	ND	ND	EPA 8260B	ug/L	1
Trichlorofluoromethane	e ND	ND	EPA 8260B	ug/L	1
Iodomethane	ND	ND	EPA 8260B	ug/L	1
Acetone	ND	ND	EPA 8260B	ug/L	10
1,1-Dichloroethene	ND	ND	EPA 8260B	ug/L	0.5
t-Butyl Alcohol (TBA)	ND	ND	EPA 8260B	ug/L	10
Methylene Chloride	ND	ND	EPA 8260B	ug/L	10
Freon 113 Corbon digulfido	ND	ND	EPA 8260B	ug/L	5
Carbon disulfide	ND ND	ND	EPA 8260B	ug/L	1
trans, 1, 2-Dichloroethen Methyl-tert-butyl-ether(		ND	EPA 8260B	ug/L	0.5
1,1-Dichloroethane	MtBE) ND ND	ND ND	EPA 8260B	ug/L	1
Vinyl acetate	ND	ND	EPA 8260B EPA 8260B	ug/L	0.5
Diisopropyl Ether (DIP)		ND	EPA 8260B	ug/L	50
Methyl Ethyl Ketone	ND ND	ND	EPA 8260B	ug/L	1
cis,1,2-Dichloroethene	ND	ND	EPA 8260B	ug/L	10 0.5
Bromochloromethane	ND	ND	EPA 8260B	ug/L ug/L	0.5
Chloroform	ND	ND	EPA 8260B	ug/L ug/L	1
2,2-Dichloropropane	ND	ND	EPA 8260B	ug/L ug/L	1
Ethyl-t-butyl ether (ETE	BE) ND	ND	EPA 8260B	ug/L	1
1,1,1-Trichloroethane	ND	ND	EPA 8260B	ug/L	1
1,2-Dichloroethane	ND	ND	EPA 8260B	ug/L	0.5
1,1-Dichloropropene	ND	ND	EPA 8260B	ug/L	1
Carbon Tetrachloride	ND	ND	EPA 8260B	ug/L	0.5
Benzene	ND	ND	EPA 8260B	ug/L	0.5
t-Amyl Methyl Ether (T		ND	EPA 8260B	ug/L	1
1,2-Dichloropropane	ND	ND	EPA 8260B	ug/L	1
Trichloroethene	ND	ND	EPA 8260B	ug/L	0.5
Dibromomethane Bromodichloromethane	ND	ND	EPA 8260B	ug/L	1
2-Chloroethylvinylether	ND	ND ND	EPA 8260B	ug/L	1
cis,1,3-Dichloropropene		ND ND	EPA 8260B	ug/L	5
4-Methyl-2-pentanone(N		NÐ ND	EPA 8260B	ug/L	1
trans, 1, 3-Dichloroprope		ND	EPA 8260B	ug/L	10
Toluene	ND ND	ND ND	EPA 8260B	ug/L	1
1,1,2-Trichloroethane	ND	ND ND	EPA 8260B	ug/L	0.5
(Continued)	in D		EPA 8260B	ug/L	1

Project ID: Project Name: 29508 Agoura – Agoura Hills

Laboratory ID: Client Sample ID:	1506-106-7 SG7-10	1506-106-8 SG8-10	Method	Units	Detection Limit
1,2-Dibromoethane(EDB)	ND	ND	EPA 8260B	ug/L	0.5
1,3-Dichloropropane	ND	ND	EPA 8260B	ug/L	1
Dibromochloromethane	ND	ND	EPA 8260B	ug/L	1
2-Hexanone	ND	ND	EPA 8260B	ug/L	10
Tetrachloroethene	ND	ND	EPA 8260B	ug/L	0.5
Chlorobenzene	ND	ND	EPA 8260B	ug/L	1
1,1,1,2-Tetrachloroethane	ND	ND	EPA 8260B	ug/L	1
Ethylbenzene	ND	ND	EPA 8260B	ug/L	0.5
m.p-Xylene	ND	ND	EPA 8260B	ug/L	0.5
Bromoform	ND	ND	EPA 8260B	ug/L	1
Styrene	ND	ND	EPA 8260B	ug/L	1
o-Xylene	ND	ND	EPA 8260B	ug/L	0.5
1,1,2,2-Tetrachloroethane	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichloropropane	ND	ND	EPA 8260B	ug/L	1
Isopropylbenzene	ND	ND	EPA 8260B	ug/L	1
Bromobenzene	ND	ND	EPA 8260B	ug/L	1
2-Chlorotoluene	ND	ND	EPA 8260B	ug/L	1
n-Propylbenzene	ND	ND	EPA 8260B	ug/L	1
4-Chlorotoluene	ND	ND	EPA 8260B	ug/L	1
1,3,5-Trimethylbenzene	ND	ND	EPA 8260B	ug/L	1
tert-Butylbenzene	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trimethylbenzene	ND	ND	EPA 8260B	ug/L	1
sec-Butylbenzene	ND	ND	EPA 8260B	ug/L	1
1,3-Dichlorobenzene	ND	ND	EPA 8260B	ug/L	1
1,4-Dichlorobenzene	ND	ND	EPA 8260B	ug/L	1
p-Isopropyltoluene	ND	ND	EPA 8260B	ug/L	1
1,2-Dichlorobenzene	ND	ND	EPA 8260B	ug/L	1
n-Butylbenzene	NĎ	ND	EPA 8260B	ug/L	1
1,2 Dibromo-3-Chloropropane	ND	ND	EPA 8260B	ug/L	1
1,2,4-Trichlorobenzene	ND	ND	EPA 8260B	ug/L	1
Naphthalene	ND	ND	EPA 8260B	ug/L	1
1,2,3-Trichlorobenzene	ND	ND	EPA 8260B	ug/L	1
Hexachlorobutadiene	ND	ND	EPA 8260B	ug/L	1
Ethanol	ND	ND	EPA 8260B	ug/L	50

ND = Not Detected at the indicated Detection Limit

SURROGATE SPIKE		% SURROGATE RECOVERY	Control Limit
Dibromofluoromethane	77	77	70-130
1,2 Dichloromethaned4	90	88	70-130
Toluene-d8	109	109	70-130
Bromofluorobenzene	103	105	70-130

Robik Yagroubi

Laboratory Director

\*The results are base upon the sample received.

Cal Tech Environmental Laboratories, Inc. ELAP ID #: 2424



6814 Rosecrans Avenue, Paramount, CA 90723-3146 Telephone: (562) 272-2700 Fax: (562) 272-2789

# QA/QC Report

Method:	8260B / TO15	Client:	Hillman
Matrix:	Water / Air	Project: Batch No:	06-106 E50616
Date Analyzed:	6/16/2015	Inst. ID	MSD #5
Date Extracted:	6/16/2015	Lab QC Sample ID:	06-109-01

Perimeters	Conc.	ug/L	Spike	Recovery	%	Control	Limits	RPD
	MS	MSD	Added	MS	MSD	Rec.	RPD	
1 1-Dichloroethene	53	51	50	106	102	70-130	30	4
Benzene	53	56	50	106	112	70-130	30	6
Trichloroethene	58	59	50	116	118	70-130	30	2
Toluene	52	56	50	104	112	70-130	30	8
Chlorobenzene	47	50	50	94	100	70-130	30	6
m,p-Xylenes	102	105	100	102	105	70-130	30	3

MS: Matrix Spike MSD: Matrix Spike Duplicate

Perimeters	Method	Units	Det.
	Blank		Limit
1,1-Dichloroethene	ND	ug/L	1
Benzene	ND	ug/L	0.5
Trichloroethene	ND	ug/L	0.5
Toluene	ND	ug/L	0.5
Chlorobenzene	ND	ug/L	0.5
m,p-Xylenes	ND	ug/L	0.6
MTBE	ND	ug/L	1
ТВА	ND	ug/L	10
DIPE	ND	ug/L	1
ETBE	ND	ug/L	1
TAME	ND	ug/L	1
1,2-Dichloroethane	ND	ug/L	0.5
EDB	ND	ug/L	0.5
Ethylbenzene	ND	ug/L	0.5
o-Xylene	ND	ug/L	0.6
TCE	ND	ug/L	1
PCE	ND	ug/L	1

Vo. Olo- 106 Page 1 of 1 Chain of Custody Record	Turn Around Time Rush Normal Analyses Requested	Comments	88	85 810	<i>Bil</i> <i>Bil</i>	B1 B1 B1	Received: Carrier:	Received by lab: W. No. NONE
Lab Job No. Olo- 10G Chain of C	Phone(714)206 3916 Fax	No. Preserv. Matrix	VAPSC X	× ×	X X 	4 +	Date / Time: $\frac{b}{b}$ $\frac{b}{b}$ $\frac{b}{b}$	Date / Time: $(G - 15 - 15)/20$ (12) Custody seal(s) in tact upon receipt by lab?
<b>al Laboratories</b> unt, CA 90723-3146 Fax: (562) 272-2789	ILLER CONSULTING BRANDON CLEHENTS 1745 ORANGELOOD AVE # 110 02ANGE CAI 92868 508 AGOURA- AGOURA HILLS 508 AGOURA- AGOURA HILLS 508 AGOURA- AGOURA HILLS 60518 AURT AM ROADSIDE RD	Sampled	6-15-15 17:30 71E0LAR	05.41	18:25	21:81 V	1mm	the above indicated tests.
CAL TECH Environmental Laboratories 6814 Rosecrans Avenue, Paramount, CA 90723-3146 Telephone: (562) 272-2700 Fax: (562) 272-2789	Client: HILLMAN Con Contact: BRANDON CU Address 1745 ORANGE Project: 39508 Alcoura Sampled By: Name/Signature	er Field	06-106-1 561-5 2 562-5	3 563-10 4 564-5	566-15		Relinquished:	I hereby authorize the performance of the above indicated tests. CTELCCR.DOC

### SOIL GAS MONITORING DATA FORM

**PROJECT:** Commercial Property

LOCATION: 29508 Roadside Drive, Agoura Hills, CA

**DATE:** June 15, 2015

		VAPOR PROBE INFO						
PROBE ID	SG1 (B7)	SG2 (B8)	SG3(B9)	SG4(B10)	SG5(B11)	SG6(B12)	SG7(B13)	SG8(B14)
PROBE DEPTH (ft)	5	5	10	5	10	15	10	10
	EXTRACTION DATA							
FLOW (L/min)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Pore Volumes (borehole - sand pack)	3	3	3	3	3	3	3	3
				MONITOF	RING DATA		·	
OXYGEN (%)								
CARBON DIOXIDE (%)								
VOC by PID (ppm)	<1	<1	<1	<1	<1	<1	<1	<1

**REMARKS:** 

SAMPLED BY:

DL

# APPENDIX C ProUCL Statistics

	A B C	DE	F	G H I J K	L
1			tics for Data	Sets with Non-Detects	_
2					
3	User Selected Options				
4	Date/Time of Computation	12/22/2015 10:31:57 AM			
5	From File	Metals.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
10					
	Ba				
12					
13			General	Statistics	
14	Total	Number of Observations	6	Number of Distinct Observations	5
15				Number of Missing Observations	0
16		Minimum	57	Mean	93.67
17		Maximum	130	Median	94
18		SD	27.28	Std. Error of Mean	11.14
19		Coefficient of Variation	0.291	Skewness	-0.0161
20					
21	Note: Sam	ple size is small (e.g., <10	D), if data ar	e collected using ISM approach, you should use	
22	guidance pr	ovided in ITRC Tech Reg	Guide on I	SM (ITRC, 2012) to compute statistics of interest.	
23	For	example, you may want to	use Cheby	shev UCL to estimate EPC (ITRC, 2012).	
24	Chebyshev	UCL can be computed u	sing the No	nparametric and All UCL Options of ProUCL 5.0	
25					
26			Normal	GOF Test	
20	S	hapiro Wilk Test Statistic	0.936	Shapiro Wilk GOF Test	
28	5% S	hapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
20		Lilliefors Test Statistic	0.225	Lilliefors GOF Test	
30	5	% Lilliefors Critical Value	0.362	Data appear Normal at 5% Significance Level	
31		Data appea	ar Normal a	5% Significance Level	
32					
33		Ass	suming Nor	nal Distribution	
34	95% No	ormal UCL		95% UCLs (Adjusted for Skewness)	
35		95% Student's-t UCL	116.1	95% Adjusted-CLT UCL (Chen-1995)	111.9
36				95% Modified-t UCL (Johnson-1978)	116.1
37					
38			Gamma	GOF Test	
39		A-D Test Statistic	0.348	Anderson-Darling Gamma GOF Test	
40		5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significant	e Level
41		K-S Test Statistic	0.256	Kolmogrov-Smirnoff Gamma GOF Test	
41		5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significant	e Level
42		Detected data appear	Gamma Di	stributed at 5% Significance Level	
43					
44 45			Gamma	Statistics	
45		k hat (MLE)	13.42	k star (bias corrected MLE)	6.819
46 47		Theta hat (MLE)	6.982	Theta star (bias corrected MLE)	13.74
47		nu hat (MLE)	161	nu star (bias corrected)	81.83
	MI	LE Mean (bias corrected)	93.67	MLE Sd (bias corrected)	35.87
49 50		(		Approximate Chi Square Value (0.05)	61.98
50				······································	

	A	В		С		D	E	=	F	G	Гн				К	-	1
51				-			Signific		0.0122	4		. ·	Ad	justed Chi	Square Va	lue	55.78
52																	
53								As	suming Gam	ma Distribu	tion						
54	ę	95% Approx	ximate C	Gamma	UCL	(use w	hen n>	>=50))	123.7		95% Ad	ljusted C	Gamm	a UCL (us	e when n<	50)	137.4
55																	
56									Lognormal	GOF Test							
57				S	hapiro	Wilk 1	Fest St	atistic	0.93		Sha	oiro Will	c Logi	normal GC	F Test		
58				5% Sł	napiro	Wilk C	Critical	Value	0.788		Data appea	ir Logno	rmal a	at 5% Sign	ificance Le	vel	
59					Lilli	efors 7	est St	atistic	0.241		Lil	liefors L	.ogno	rmal GOF	Test		
60				59	% Lillie	efors C	Critical	Value	0.362		Data appea	ir Logno	rmal a	at 5% Sign	ificance Le	vel	
61							Data a	appear	r Lognormal a	at 5% Signi	ficance Leve						
62																	
63									Lognorma	Statistics							
64							ogged		4.043						of logged D		4.502
65				Ν	/laximu	um of L	ogged	d Data	4.868					SD c	of logged D	ata	0.306
66																	
67									uming Logno	rmal Distrib	oution						
68	95% H-UCL         128.4         90% Chebyshev (MVUE) UCL           95% Chebyshev (MVUE) UCL         144.9         97.5% Chebyshev (MVUE) UCL							128.9									
69		95% Chebyshev (MVUE) UCL         144.9         97.5% Chebyshev (MVUE) UCL           99% Chebyshev (MVUE) UCL         210.4         97.5% Chebyshev (MVUE) UCL						167									
70				99% (	Cheby	shev (	MVUE	) UCL	210.4								
71																	
72							-		etric Distribut								
73					Data	appea	r to fol	low a	Discernible I	Distribution	at 5% Signif	icance l	_evel				
74																	
75						0.5		-	rametric Dist	ribution Fre	e UCLs			050/			110.1
76				050/	0. 1		5% CLT								ackknife U		116.1
77							otstrap		110.1						otstrap-t U		116.3
78							otstrap		109.6 109.2			9	95% P	ercentile E	Bootstrap U		111.2
79							otstrap					050		hughou/M			142.2
80				0% Ch .5% Ch				-	127.1 163.2						ean, Sd) U ean, Sd) U		142.2 204.5
81			37.	.5 /0 UII	GUYSII		an, Su	, 001	103.2			99			can, 3u) U		204.3
82									Suggested		1						
83					95	% Stu	dent's-	t UCI	116.1								
84							2011 0-										
85		Note: Suga	restions	regard	ina the	e selec	tion of	a 95%	6 UCL are pro	ovided to he	lp the user to	select 1	the m	ost approp	riate 95% I	JCI	
86		00		0	0				sults of the si		•						
87							•		ver, simulatio				-	-		,	
88				9.1			-		ht the user m								
89 90										,							
		Note: Fo	or highly	/ negat	ively-s	skewe	d data,	, confi	dence limits	(e.g., Chen	, Johnson, L	ognorma	al, an	d Gamma)	) may not b	e	
91 92				-	-				ethods provid	, -		-		-	• • •		
							_		•	-	•	•					
93																	

	A B C	D E	F	G H I J K	1
1			•	Sets with Non-Detects	
2					
3	User Selected Options				
4	Date/Time of Computation	12/22/2015 10:38:57 AM			
5	From File	TPH.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
-	C18-C28				
11					
12			General	Statistics	
13	Total	Number of Observations	15	Number of Distinct Observations	9
14		Number of Detects	8	Number of Non-Detects	7
15	Ν	umber of Distinct Detects	8	Number of Distinct Non-Detects	1
16		Minimum Detect	11	Minimum Non-Detect	10
17		Maximum Detect	23	Maximum Non-Detect	10
18		Variance Detects	18.41	Percent Non-Detects	46.67%
		Mean Detects	15.88	SD Detects	4.291
19		Median Detects	14.5	CV Detects	0.27
20		Skewness Detects	0.621	Kurtosis Detects	-1.022
21		Mean of Logged Detects	2.734	SD of Logged Detects	0.264
22					
23		Norm	al GOF Tes	t on Detects Only	
24	S	hapiro Wilk Test Statistic	0.921	Shapiro Wilk GOF Test	
25 26		hapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Lev	el
		Lilliefors Test Statistic	0.206	Lilliefors GOF Test	
27	5	% Lilliefors Critical Value	0.313	Detected Data appear Normal at 5% Significance Lev	el
28 29		Detected Data a	appear Norn	nal at 5% Significance Level	
30				•	
	Kaplan-	Meier (KM) Statistics usir	na Normal C	ritical Values and other Nonparametric UCLs	
31 32	•	Mean	13.13	Standard Error of Mean	1.144
		SD	4.145	95% KM (BCA) UCL	14.93
33		95% KM (t) UCL	15.15	95% KM (Percentile Bootstrap) UCL	15
34		95% KM (z) UCL	15.02	95% KM Bootstrap t UCL	15.6
35 36		90% KM Chebyshev UCL	16.57	95% KM Chebyshev UCL	18.12
36 37		.5% KM Chebyshev UCL	20.28	99% KM Chebyshev UCL	24.52
37					
38 39		Gamma GOF	Tests on De	etected Observations Only	
39 40		A-D Test Statistic	0.318	Anderson-Darling GOF Test	
40		5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance	e Level
41		K-S Test Statistic	0.182	Kolmogrov-Smirnoff GOF	
42		5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance	e Level
43				stributed at 5% Significance Level	
44 45				-	
45 46		Gamma	Statistics or	n Detected Data Only	
46		k hat (MLE)	16.33	k star (bias corrected MLE)	10.29
47		Theta hat (MLE)	0.972	Theta star (bias corrected MLE)	1.543
48 49		nu hat (MLE)	261.3	nu star (bias corrected)	164.6
	M	LE Mean (bias corrected)	15.88	MLE Sd (bias corrected)	4.949
50		(		(	

	A B C D E	F	G	н	I		J		К	L
51	· · · · · ·									
52	Gamma	a Kaplan-M	eier (KM) St	atistics						
53	k hat (KM)	10.04						nu l	nat (KM)	301.2
54	Approximate Chi Square Value (301.16, $\alpha$ )	262			ljusted Cł	•		`	••••	257.5
55	95% Gamma Approximate KM-UCL (use when n>=50)	15.1		95% Gamma	Adjusted	I KM-U	ICL (us	se whe	en n<50)	15.36
56										
57	Gamma ROS									
58	GROS may not be used when data se						iple DL	S		
59	GROS may not be used v									
60	For such situations, GROS m		-							
61	For gamma distributed detected data, BTVs a		y be compu	ted using gam	ma distrit	oution	on KM	estim		1
62	Minimum	0.234							Mean	10.77
63	Maximum	23							Median	
64	SD	6.699							CV	0.622
65	k hat (MLE)	1.569					`		ed MLE)	1.3
66	Theta hat (MLE)	6.864			Theta				ed MLE)	8.286
67	nu hat (MLE)	47.07					•		orrected)	38.99
68	MLE Mean (bias corrected)	10.77					•		rrected)	9.447
69					•			-	ance (β)	0.0324
70	Approximate Chi Square Value (38.99, α)	25.69			djusted C			•	.,	24.36
71	95% Gamma Approximate UCL (use when n>=50)	16.35		95% Gai	mma Adju	isted U	ICL (us	se whe	en n<50)	17.24
72										
73	Lognormal GO		etected Obs		•					
74	Shapiro Wilk Test Statistic	0.943			Shapiro V					
75	5% Shapiro Wilk Critical Value	0.818	Det	ected Data ap				Signi	ficance l	.evel
76	Lilliefors Test Statistic	0.164			Lilliefor					
77	5% Lilliefors Critical Value	0.313		ected Data ap		normal	at 5%	Signi	ficance l	.evel
78	Detected Data ap	pear Logno	rmal at 5% S	Significance L	evel					
79					_					
80			Using Imput	ed Non-Detec	ts					0.075
81	Mean in Original Scale	11.88							og Scale	
82	SD in Original Scale	5.473			050	<u> </u>			og Scale	
83	95% t UCL (assumes normality of ROS data)	14.37			95%				rap UCL	14.11
84	95% BCA Bootstrap UCL	14.48				,	95% Bo	ootstra	ap t UCL	14.97
85	95% H-UCL (Log ROS)	15.44								
86	LOL o using Lognormal Distribution and						Distrik			
87	UCLs using Lognormal Distribution and KM Mean (logged)		es when De		re Logno	-			(M -Log)	15.06
88	( 30 )	2.533			0.5.0/			``	0,	15.06
89	KM Standard Error of Maga (lagged)	0.281			95%		ai Fi V	aiue (I	<m-log)< td=""><td>1.867</td></m-log)<>	1.867
90	KM Standard Error of Mean (logged)	0.0775								
91			tatistics							
92	DL/2 Normal	0025	ເລແອນເຮັ		<u></u>	Trong	forme	d		
93		10.8			DL/2 Log	j-i rans			a Sool-	2 200
94	Mean in Original Scale								og Scale	
95	SD in Original Scale 95% t UCL (Assumes normality)	6.383 13.7							og Scale Stat UCL	15.68
96			lod for corre	norioene en d	hiotoriar'	10000		/o ⊓-C		10.00
97	DL/2 is not a recommended me	erioa, provid	ieu ior com	parisons and	nistorical	reaso	115			
98	Ale::	tria Diatatha	tion Free LV							
99	Nonparame									
100	Detected Data appear	i normal Di		o % Significan	Ce Level					

	А	В	С	D	E	F	G	Н	I	J	K	L
101												
102						Suggested	UCL to Use					
103				95%	KM (t) UCL	15.15			95% KM (P	ercentile Bo	otstrap) UCL	15
104												
105		Note: Sugges	stions regardi	ng the seled	tion of a 95%	6 UCL are pr	ovided to hel	p the user to	select the m	nost appropri	ate 95% UCI	
106			R	ecommenda	tions are ba	sed upon dat	a size, data o	distribution,	and skewnes	s.		
107		These recon	nmendations	are based u	ipon the resu	Its of the sim	nulation studi	es summari	zed in Singh,	Maichle, an	d Lee (2006)	
108	Ho	owever, simul	ations results	will not cov	er all Real V	/orld data se	ts; for additio	onal insight t	he user may	want to cons	ult a statistic	ian.
109												

User Selected Options	UCL Statist	ics for Data	Sets with Non-Detects	
•				
•				
Date/Time of Computation	12/22/2015 10:39:32 AM			
From File	TPH.xls			
Full Precision	OFF			
	95%			
Number of Bootstrap Operations	2000			
C28-C36				
Total				9
				7
Ni		-		1
				10
				10
				46.67%
				11.93
				0.465
				-1.33
	Mean of Logged Detects	3.152	SD of Logged Detects	0.453
			t an Datasta Only	
0			-	
	-		-	
5% 51	•			
E				
J				
		ippear Norri		
Kanlan-I	Moior (KM) Statistics usir	a Normal C	ritical Values and other Nonparametric LICLs	
		-	-	3.113
				23.2
				23.27
				25.87
Q	. ,		· ·	31.9
	-			49.3
	Gamma GOF	Tests on De	etected Observations Only	
	A-D Test Statistic	0.49	-	
	5% A-D Critical Value	0.719		e Level
	K-S Test Statistic	0.208	Kolmogrov-Smirnoff GOF	
	5% K-S Critical Value	0.295	-	e Level
			· · · · · · · · · · · · · · · · · · ·	
	Gamma	Statistics or	Detected Data Only	
	k hat (MLE)	5.617	k star (bias corrected MLE)	3.594
	Theta hat (MLE)	4.562	Theta star (bias corrected MLE)	7.13
	nu hat (MLE)	89.88	nu star (bias corrected)	57.51
ML	E Mean (bias corrected)	25.63	MLE Sd (bias corrected)	13.52
	Total Nu Nu Si	Total Number of Observations Number of Distinct Detects Number of Distinct Detects Minimum Detect Maximum Detect Variance Detects Mean Detects Skewness Detects Mean of Logged Detects Mean of Logged Detects Mean of Logged Detects Norm Shapiro Wilk Test Statistic 5% Shapiro Wilk Critical Value Lilliefors Test Statistic 5% Lilliefors Critical Value Detected Data a Kaplan-Meier (KM) Statistics usir Mean SD 95% KM (t) UCL 95% KM (t) UCL 95% KM (z) UCL 97.5% KM Chebyshev UCL 97.5% KM Chebyshev UCL 5% A-D Test Statistic 5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value SD SD SD SD SD SD SM K (MLE) Theta hat (MLE)	Ceneral           Total Number of Observations         15           Number of Distinct Detects         8           Number of Distinct Detects         8           Minimum Detect         14           Maximum Detect         142.3           Wean Detects         25.63           Median Detects         20.5           Skewness Detects         0.701           Mean of Logged Detects         3.152           Normal GOF Test           Shapiro Wilk Test Statistic         0.865           5% Shapiro Wilk Critical Value         0.818           Lilliefors Test Statistic         0.244           5% Lilliefors Critical Value         0.313           Detected Data appear Normal C           Kaplan-Meier (KM) Statistics usin Normal C           Mean         18.33           SD         11.28           95% KM (z) UCL         23.45           90% KM Chebyshev UCL         27.67           97.5% KM Chebyshev UCL         37.77           Gamma GOF Tests on De           A-D Test Statistic         0.49           5% A-D Critical Value         0.719           5% K-S Critical Value         0.719           Gamma GOF Tests	General Statistics           Total Number of Observations         15         Number of Distinct Observations           Number of Distinct Detects         8         Number of Distinct Non-Detects           Number of Distinct Detects         8         Number of Distinct Non-Detects           Minimum Detect         14         Maximum Non-Detects           Maximum Detect         45         Maximum Non-Detects           Variance Detects         142.3         Percent Non-Detects           Median Detects         25.5         CV Detects           Skewness Detects         0.701         Kurtoss Detects           Skewness Detects         0.701         Kurtoss Detects           Shapiro Wilk Cot Statistic         0.865         Shapiro Wilk GOF Test           Shapiro Wilk Test Statistic         0.865         Shapiro Wilk GOF Test           Shapiro Wilk Cottical Value         0.313         Detected Data appear Normal at 5% Significance Level           Veliceted Data appear Normal at 5% Significance Level         Stadard Error of Mean           System (V) UCL         23.45         95% KM (CAC) UCL           System (V) UCL         23.45         95% KM (CAC) UCL           95% KM (Chebyshev UCL         27.67         95% KM (CAC) UCL           95% KM (Chebyshev UCL         27.67 </td

	A B C D E	F	G	Н				J		К	—	
51												
52	Gamma	a Kaplan-M	eier (KM) S	tatistics								
53	k hat (KM)	2.643							nu	hat (K	M)	79.3
54	Approximate Chi Square Value (79.30, $\alpha$ )	59.78			Adjı	usted (	Chi S	quare \	Value	(79.30,	β)	57.7
55	95% Gamma Approximate KM-UCL (use when n>=50)	24.32		95% Gan	nma Ao	djusteo	d KM	-UCL (I	use wh	nen n<5	0)	25.2
56												
57	Gamma ROS S											
58	GROS may not be used when data se							ultiple D	DLs			
59	GROS may not be used v											
60	For such situations, GROS me											
61	For gamma distributed detected data, BTVs ar		iy be compu	ited using g	gamma	a distri	butio	n on Kl	VI estir			
62	Minimum	0.01								Me	-	14.49
63	Maximum	45								Medi	-	14
64	SD	15.03									CV	1.037
65	k hat (MLE)	0.342						`		ted ML		0.318
66	Theta hat (MLE)	42.33				Thet				ted ML		45.53
67	nu hat (MLE)	10.27							•	correcte		9.55
68	MLE Mean (bias corrected)	14.49							•	correcte		25.69
69						•			-	cance (		0.0324
70	Approximate Chi Square Value (9.55, $\alpha$ )	3.662				•		•		e (9.55,		3.226
71	95% Gamma Approximate UCL (use when n>=50)	37.79		95%	Gamm	a Adju	usted	UCL (I	use wh	nen n<5	0)	42.9
72												
73	Lognormal GOI	F Test on D	etected Ob	servations	-							
74	Shapiro Wilk Test Statistic	0.897			Sh	apiro \	Wilk	GOF T	est			
75	5% Shapiro Wilk Critical Value	0.818	De	tected Data	a appe	ar Log	norm	al at 5°	% Sigr	nificanc	e Le	vel
76	Lilliefors Test Statistic	0.188			L	lliefo	rs G	OF Tes	st			
77	5% Lilliefors Critical Value	0.313	De	tected Data	a appe	ar Log	norm	al at 5°	% Sigr	hificanc	e Le	vel
78	Detected Data ap	pear Logno	rmal at 5%	Significand	ce Lev	el						
79												
80	Lognormal ROS		Using Impu	ted Non-De	etects							
81	Mean in Original Scale	16.84								.og Sca		2.544
82	SD in Original Scale	12.98								_og Sca		0.792
83	95% t UCL (assumes normality of ROS data)	22.74				95%	% Pe			strap U0		22.46
84	95% BCA Bootstrap UCL	23.55						95% I	Bootst	rap t U(	CL	24.15
85	95% H-UCL (Log ROS)	29.14										
86												
87	UCLs using Lognormal Distribution and		tes when De	etected dat	ta are	Logno		-				
88	KM Mean (logged)	2.756								KM -Lo		24.21
89	KM SD (logged)	0.525				95%	% Cri	tical H	Value	(KM-Lo	g)	2.095
90	KM Standard Error of Mean (logged)	0.145										
91												
92		DL/2 S	tatistics					-				
93	DL/2 Normal				DL	./2 Log	g-Tra	nsform			<u> </u>	
94	Mean in Original Scale	16								_og Sca		2.432
95	SD in Original Scale	13.59								.og Sca		0.858
96	95% t UCL (Assumes normality)	22.18		-					95% H-	Stat U	CL	29.38
97	DL/2 is not a recommended me	thod, provi	ded for com	parisons a	nd his	torical	l reas	sons				
98												
99	Nonparamet											
100	Detected Data appear	r Normal Dis	stributed at	5% Signifi	cance	Level						

	А	В	С	D	Е	F	G	Н		J	K	L
101												
102						Suggested	UCL to Use					
103				95%	KM (t) UCL	23.82			95% KM (P	ercentile Boo	otstrap) UCL	23.27
104												
105		Note: Sugges	stions regardi	ng the selec	tion of a 95%	6 UCL are pr	ovided to hel	p the user to	select the m	iost appropri	ate 95% UCL	
106			R	ecommenda	tions are ba	sed upon dat	ta size, data (	distribution, a	and skewnes	S.		
107		These recor	nmendations	are based u	pon the resu	ilts of the sim	nulation studi	es summariz	zed in Singh,	Maichle, and	d Lee (2006).	
108	Ho	owever, simul	ations results	s will not cov	er all Real V	/orld data se	ts; for additic	onal insight th	ne user may	want to cons	ult a statistic	ian.
109												

	A B C	D E	F	G H I J K	L
1		UCL Statis	tics for Data	Sets with Non-Detects	
2					
3	User Selected Options				
4	Date/Time of Computation	12/22/2015 10:40:12 AM			
5	From File	TPH.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
10	C36-C40				
11					
12				Statistics	
13	Total	Number of Observations	15	Number of Distinct Observations	7
14		Number of Detects	8	Number of Non-Detects	7
15	N	umber of Distinct Detects	6	Number of Distinct Non-Detects	1
16		Minimum Detect	15	Minimum Non-Detect	10
17		Maximum Detect	45	Maximum Non-Detect	10
18		Variance Detects	106	Percent Non-Detects	46.67%
19		Mean Detects	22.38	SD Detects	10.29
20		Median Detects	17	CV Detects	0.46
21		Skewness Detects	1.827	Kurtosis Detects	3.37
22		Mean of Logged Detects	3.035	SD of Logged Detects	0.387
23					
24				t on Detects Only	
25		hapiro Wilk Test Statistic	0.744	Shapiro Wilk GOF Test	
26	5% S	napiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
27		Lilliefors Test Statistic	0.29	Lilliefors GOF Test	<u> </u>
28	5	% Lilliefors Critical Value	0.313	Detected Data appear Normal at 5% Significance Leve	el
29		Detected Data appear	Approximat	e Normal at 5% Significance Level	
30	Kanlan	Maior (I/M) Otatiation wair		Nitiaal Values and other Nonnegaratic LIOLs	
31	Kapian-			Critical Values and other Nonparametric UCLs Standard Error of Mean	0.500
32		Mean	16.6	95% KM (BCA) UCL	2.583
33		SD 95% KM (t) UCL	9.358 21.15	95% KM (Percentile Bootstrap) UCL	21
34		95% KM (t) UCL	21.15	95% KM (Percentile Bootstrap) OCL 95% KM Bootstrap t UCL	20.8
35		95 % KM (2) UCL	20.85	95% KM Boolstrap ( OCL 95% KM Chebyshev UCL	23.86
36		.5% KM Chebyshev UCL	32.73	99% KM Chebyshev UCL	42.3
37	57		52.75		72.0
38		Gamma GOF	Tests on De	etected Observations Only	
39		A-D Test Statistic	0.81	Anderson-Darling GOF Test	
40		5% A-D Critical Value	0.717	Detected Data Not Gamma Distributed at 5% Significance	level
41		K-S Test Statistic	0.29	Kolmogrov-Smirnoff GOF	
42		5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significanc	e Level
43				Distribution at 5% Significance Level	
44					
45		Gamma	Statistics or	n Detected Data Only	
46		k hat (MLE)	6.979	k star (bias corrected MLE)	4.445
47 48		Theta hat (MLE)	3.206	Theta star (bias corrected MLE)	5.033
48 49		nu hat (MLE)	111.7	nu star (bias corrected)	71.13
	MI	_E Mean (bias corrected)	22.38	MLE Sd (bias corrected)	10.61
50		(		(	

	A B C D E	F	G	Н			J		К	L
51	iii							•		
52	Gamma	a Kaplan-Mo	eier (KM) S	tatistics						
53	k hat (KM)	3.147						nu ł	nat (KM)	94.4
54	Approximate Chi Square Value (94.40, $\alpha$ )	72.99			Adjusted	Chi Sc	quare V	alue (9	4.40, β)	70.68
55	95% Gamma Approximate KM-UCL (use when n>=50)	21.47		95% Gam	ma Adjuste	ed KM-	UCL (u	se whe	en n<50)	22.17
56	·									
57	Gamma ROS S	Statistics us	sing Impute	d Non-Dete	ects					
58	GROS may not be used when data se	et has > 50%	NDs with	many tied of	servations	at mu	ltiple DI	_S		
59	GROS may not be used v	when kstar c	of detected	data is smal	such as <	0.1				
60	For such situations, GROS me	ethod tends	to yield infl	ated values	of UCLs a	nd BTV	's			
61	For gamma distributed detected data, BTVs ar	nd UCLs ma	y be compu	uted using g	amma dist	ribution	on KM	estim	ates	
62	Minimum	0.01							Mean	12.81
63	Maximum	45							Median	15
64	SD	12.96							CV	1.012
65	k hat (MLE)	0.356				k star	(bias c	orrecte	ed MLE)	0.329
66	Theta hat (MLE)	36			The	eta star	(bias c	orrecte	ed MLE)	38.92
67	nu hat (MLE)	10.68				n	u star (l	oias co	rrected)	9.874
68	MLE Mean (bias corrected)	12.81				ML	E Sd (I	oias co	rrected)	22.33
69					Adjus	sted Le	vel of S	Signific	ance (β)	0.0324
70	Approximate Chi Square Value (9.87, $\alpha$ )	3.863			Adjuste	d Chi S	Square	Value	(9.87, β)	3.413
71	95% Gamma Approximate UCL (use when n>=50)	32.74		95% (	Gamma Ad	justed	UCL (u	se whe	en n<50)	37.07
72										
73	Lognormal GO	F Test on D	etected Ob	servations	Only					
74	Shapiro Wilk Test Statistic	0.811			Shapiro	Wilk C	GOF Te	st		
75	5% Shapiro Wilk Critical Value	0.818	C	Detected Dat	a Not Logi	normal	at 5% S	Signific	ance Le	vel
76	Lilliefors Test Statistic	0.27			Lillief	ors GC	)F Test			
77	5% Lilliefors Critical Value	0.313		tected Data		-	al at 5%	Signi	icance L	.evel
78	Detected Data appear A	pproximate	Lognormal	at 5% Sign	ificance Le	evel				
79										
80	Lognormal ROS		Using Impu	ted Non-De	tects					
81	Mean in Original Scale	15.38							og Scale	2.529
82	SD in Original Scale	10.74							og Scale	0.661
83	95% t UCL (assumes normality of ROS data)	20.26			95	5% Per			ap UCL	19.95
84	95% BCA Bootstrap UCL	21.82					95% B	ootstra	ptUCL	22.59
85	95% H-UCL (Log ROS)	23.25								
86										
87	UCLs using Lognormal Distribution and		es when D	etected data	a are Logn					00.00
88	KM Mean (logged)	2.693						•	M -Log)	20.86
89	KM SD (logged)	0.451			95	% Criti	cal H V	alue (ł	(M-Log)	2.017
90	KM Standard Error of Mean (logged)	0.124								
91										
92		DL/2 St	atistics		<b>B</b> 1 /					
93	DL/2 Normal	44.0-			DL/2 Lo	og-Trar				
94	Mean in Original Scale	14.27							g Scale	2.37
95	SD in Original Scale	11.55							og Scale	0.785
96	95% t UCL (Assumes normality)	19.52						o‰ H-S	stat UCL	24.19
97	DL/2 is not a recommended me	nod, provid	aed for con	nparisons ar	nd historica	al reas	ons			
98			. <u> </u>							
99	Nonparamet									
100	Detected Data appear Appro	ximate Nori	mai Distrib	uted at 5% S	significanc	e Leve				

	А	В	С	D	E	F	G	Н	I	J	K	L
101												
102						Suggested	UCL to Use					
103				95%	KM (t) UCL	21.15			95% KM (P	ercentile Bo	otstrap) UCL	20.8
104												
105		Note: Sugges	stions regardi	ng the selec	tion of a 95%	6 UCL are pr	ovided to hel	p the user to	select the m	nost appropri	ate 95% UCL	
106			R	ecommenda	tions are ba	sed upon dat	a size, data o	distribution,	and skewnes	s.		
107		These recon	nmendations	are based u	ipon the resu	Its of the sim	nulation studi	es summari	zed in Singh,	Maichle, an	d Lee (2006).	
108	Ho	owever, simul	ations results	s will not cov	er all Real V	Vorld data se	ts; for additio	onal insight t	he user may	want to cons	ult a statistic	ian.
109												

	АВС	DE	F		1
1			tics for Data	a Sets with Non-Detects	
2					
3	User Selected Options	3			
4	Date/Time of Computation	12/22/2015 10:33:29 AM			
5	From File	Metals.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
10	Cd				
11					
12			General	Statistics	
13	Total	Number of Observations	6	Number of Distinct Observations	6
14		Number of Detects	5	Number of Non-Detects	1
15	Ν	umber of Distinct Detects	5	Number of Distinct Non-Detects	1
16		Minimum Detect	1.8	Minimum Non-Detect	1
17		Maximum Detect	34	Maximum Non-Detect	1
18		Variance Detects	168.6	Percent Non-Detects	16.67%
19		Mean Detects	11.1	SD Detects	12.98
20		Median Detects	6.2	CV Detects	1.17
21		Skewness Detects	2.076	Kurtosis Detects	4.494
22		Mean of Logged Detects	1.948	SD of Logged Detects	1.048
23					
24			•	re collected using ISM approach, you should use	
25		-	-	SM (ITRC, 2012) to compute statistics of interest.	
26				yshev UCL to estimate EPC (ITRC, 2012).	
27	Chebyshe	v UCL can be computed u	using the No	onparametric and All UCL Options of ProUCL 5.0	
28					
29				st on Detects Only	
30		Shapiro Wilk Test Statistic	0.706	Shapiro Wilk GOF Test	
31	5% 5	hapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
32		Lilliefors Test Statistic	0.406	Lilliefors GOF Test	
33	5	5% Lilliefors Critical Value	0.396	Detected Data Not Normal at 5% Significance Level	
34				al at 5% Significance Level	
35	Vorter	Major (KM) Statistics	a Normal (	Critical Values and other Nonparametric UCLs	
36	rapian-	Meier (KM) Statistics usin Mean	9.417	Standard Error of Mean	5.134
37		SD	9.417	95% KM (BCA) UCL	19.32
38		95% KM (t) UCL	19.76	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL	19.32
39		95% KM (t) UCL 95% KM (z) UCL	19.76	95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL	38.46
40		90% KM Chebyshev UCL	24.82	95% KM Chebyshev UCL	31.8
41		7.5% KM Chebyshev UCL	41.48	99% KM Chebyshev UCL	60.5
42			-T.TO		00.0
43		Gamma GOF	Tests on D	etected Observations Only	
44		A-D Test Statistic	0.506	Anderson-Darling GOF Test	
45		5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance	e Level
46		K-S Test Statistic	0.333	Kolmogrov-Smirnoff GOF	
47		5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance	e Level
48				stributed at 5% Significance Level	
40				· · · · · · · · · · · · · · · · · · ·	
49 50					

	A B C D E	F	G H I J K	L									
51	-	Statistics or	n Detected Data Only										
52	k hat (MLE)	1.23	k star (bias corrected MLE) 0.6										
53	Theta hat (MLE)	9.023	Theta star (bias corrected MLE)										
54	nu hat (MLE)	12.3	nu star (bias corrected)										
55	MLE Mean (bias corrected)	11.1	MLE Sd (bias corrected)										
56													
57	Gamm	a Kaplan-M	eier (KM) Statistics										
58	k hat (KM)	0.701	nu hat (KM) 8.40										
59	Approximate Chi Square Value (8.41, $\alpha$ )	2.974	Adjusted Chi Square Value (8.41, $\beta$ )	1.937									
60	95% Gamma Approximate KM-UCL (use when n>=50)	26.62	95% Gamma Adjusted KM-UCL (use when n<50)										
61													
62	Gamma ROS Statistics using Imputed Non-Detects												
63	-		6 NDs with many tied observations at multiple DLs										
64			of detected data is small such as < 0.1										
65	· · · · · · · · · · · · · · · · · · ·		to yield inflated values of UCLs and BTVs										
66	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
67	Minimum	0.01	Mean	9.252									
68	Maximum	34	Median	6.05									
69	SD	12.46	CV	1.347									
70	k hat (MLE)	0.469	k star (bias corrected MLE)	0.345									
71	Theta hat (MLE)	19.74	Theta star (bias corrected MLE)	26.78									
72	nu hat (MLE)	5.625	nu star (bias corrected)	4.146									
73	MLE Mean (bias corrected)	9.252	MLE Sd (bias corrected)	15.74									
74			Adjusted Level of Significance (β)	0.0122									
75	Approximate Chi Square Value (4.15, $\alpha$ )	0.78	Adjusted Chi Square Value (4.15, β)	0.386									
76	95% Gamma Approximate UCL (use when n>=50)	49.16	95% Gamma Adjusted UCL (use when n<50)	99.3									
77													
78	_		etected Observations Only										
79	Shapiro Wilk Test Statistic	0.923	Shapiro Wilk GOF Test										
80	5% Shapiro Wilk Critical Value Lilliefors Test Statistic	0.762	Detected Data appear Lognormal at 5% Significance Level										
81			Lilliefors GOF Test										
82	5% Lilliefors Critical Value       0.396       Detected Data appear Lognormal at 5% Significance Level         Detected Data appear Lognormal at 5% Significance Level												
83		pear Logno	rmai at 5% Significance Level										
84	Lognormal BO	C Statiation	Using Imputed Non-Detects										
85	Mean in Original Scale	9.338	Mean in Log Scale	1.517									
86	SD in Original Scale	12.39	SD in Log Scale	1.413									
87	95% t UCL (assumes normality of ROS data)	12.39	95% Percentile Bootstrap UCL	18.37									
88	95% BCA Bootstrap UCL	20.28	95% Bootstrap t UCL										
89	95% H-UCL (Log ROS)	417.4											
90													
91	UCLs using Lognormal Distribution and	KM Estimat	tes when Detected data are Lognormally Distributed										
92	KM Mean (logged)	1.624	95% H-UCL (KM -Log)	93.62									
93	KM SD (logged)	1.122	95% Critical H Value (KM-Log)	4.555									
94	KM Standard Error of Mean (logged)	0.512											
95 06													
96 07		DL/2 S	tatistics										
97 98	DL/2 Normal		DL/2 Log-Transformed										
98 99	Mean in Original Scale	9.333	Mean in Log Scale	1.508									
99 100	SD in Original Scale	12.39	SD in Log Scale	1.429									
100		-		-									

	А	В	С	D	E	F	G	Н		J	K	L			
101	95% t UCL (Assumes normality) 19.53 95% H-Stat UCL														
102		DL/2 is not a recommended method, provided for comparisons and historical reasons													
103															
104	Nonparametric Distribution Free UCL Statistics														
105	Detected Data appear Gamma Distributed at 5% Significance Level														
106															
107	Suggested UCL to Use														
108	95% KM (Chebyshev) UCL 31.8 95% GROS Adjusted Gamma									Gamma UCL	99.3				
109			95% Ad	djusted Gam	ma KM-UCL	40.88									
110	Warning: Recommended UCL exceeds the maximum observation														
111															
112	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.														
113	Recommendations are based upon data size, data distribution, and skewness.														
114		These recor	nmendations	are based u	upon the resu	Its of the sin	nulation studi	es summariz	zed in Singh,	, Maichle, an	id Lee (2006).				
115	Н	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.													
116															

	A B C D E	F	G H I J K I	L
1		tics for Data	Sets with Non-Detects	_
2				
3	User Selected Options			
4	Date/Time of Computation 12/22/2015 10:35:01 AM			
5	From File Metals.xls			
6	Full Precision OFF			
7	Confidence Coefficient 95%			
8	Number of Bootstrap Operations 2000			
9				
10				
11	Cr			
12				
13			Statistics	
14	Total Number of Observations	6	Number of Distinct Observations	6
15			Number of Missing Observations	0
16	Minimum	2.1	Mean	28.52
17	Maximum	47	Median	32.5
18	SD	18.31	Std. Error of Mean	7.475
19	Coefficient of Variation	0.642	Skewness	-0.552
20				
21		-	e collected using ISM approach, you should use	
22			SM (ITRC, 2012) to compute statistics of interest.	
23		-	rshev UCL to estimate EPC (ITRC, 2012).	
24	Chebyshev UCL can be computed u	ising the No	nparametric and All UCL Options of ProUCL 5.0	
25		Nermald	GOF Test	
26				
27	Shapiro Wilk Test Statistic	0.912	Shapiro Wilk GOF Test	
28	5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level Lilliefors GOF Test	
29	Lilliefors Test Statistic 5% Lilliefors Critical Value	0.198		
30			Data appear Normal at 5% Significance Level	
31				
32	۵۹	suming Nor	nal Distribution	
33	95% Normal UCL		95% UCLs (Adjusted for Skewness)	
34	95% Student's-t UCL	43.58	95% Adjusted CLT UCL (Chen-1995)	39.01
35		40.00	95% Modified-t UCL (Johnson-1978)	43.3
36				40.0
37		Gamma	GOF Test	
38	A-D Test Statistic	0.507	Anderson-Darling Gamma GOF Test	
39	5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance	e l evel
40	K-S Test Statistic	0.252	Kolmogrov-Smirnoff Gamma GOF Test	
41	5% K-S Critical Value	0.338	Detected data appear Gamma Distributed at 5% Significance	e Level
42 43			stributed at 5% Significance Level	
43 44			-	
44 45		Gamma	Statistics	
45 46	k hat (MLE)	1.457	k star (bias corrected MLE)	0.839
46 47	Theta hat (MLE)	19.58	Theta star (bias corrected MLE)	33.97
47	nu hat (MLE)	17.48	nu star (bias corrected)	10.07
48 49	MLE Mean (bias corrected)	28.52	MLE Sd (bias corrected)	31.12
49 50			Approximate Chi Square Value (0.05)	3.988
50				

	А	В	—	С	<del></del>	D	1	E	F	G	Н	<u>г</u>		J			к	
51	Λ	D		-	sted I	_evel of	Signi	_	0.0122	u			Ad	justed	Chi S			2.732
52																		
53								As	suming Gam	nma Distribu	ition							
54	9	5% Approx	imate	Gamma	a UCI	_ (use v	vhen n	ı>=50))	72.04		95% Ad	justed (	Gamn	na UCL	(use	when	n<50)	105.2
55												-						
56									Lognorma	I GOF Test								
57				S	Shapir	ro Wilk	Test S	Statistic	0.797		Shap	oiro Wil	k Log	normal	GOF	Test		
58				5% S	Shapir	o Wilk (	Critica	l Value	0.788		Data appea		-				Level	
						lliefors			0.274			liefors l			-			
59 60				5	5% Lil	liefors	Critica	l Value	0.362		Data appea		-				Level	
60 61										at 5% Signi	ficance Leve	-						
61																		
62									Lognorma	I Statistics								
63					Minir	num of	Loade	ed Data	0.742					Me	an of	loaaea	d Data	2.97
64						num of			3.85								d Data	1.202
65				•			Logge		0.00							loggot	a Data	1.202
66								Δεε	uming Logno	rmal Distrik	oution							
67							95%	H-UCL	538.1				90% (	Chebys	hov (l			82.64
68				95%	Chet	weboy		E) UCL						Chebys	``		,	135.2
69						yshev	•	,	195.2			57		Shebys			.) 00L	155.2
70				3370		ysnev			195.2									
71							Non	naram	otrio Distribu	tion Free LI	CL Statistics							
72					Date			•			at 5% Signifi	cance						
73						a appeo			Discertible	Distribution	at 5 /6 Signin	cance	Levei					
74								Nonno	rametric Dis	tribution Era								
75						0		T UCL	40.81					05	9/ lo	okknif	e UCL	43.58
76				0.50/	Ctor	dard B			39.75								-t UCL	43.56
77						Hall's B		•	39.75				)E0/ F	Percenti		•		39.33
78						BCA B		•	37.04			:	90% F	reicent		otstra	PUCL	39.33
79								•				05				0-		C1 1
80				90% Cł 7.5% Cł	-	-			50.94 75.2					ebyshe ebyshe	`		,	61.1 102.9
81			9.	7.0 % CI	lebys		5dii, 3	u) UCL	75.2			99	/0 UN	ebysne	v(iviea	an, 30		102.9
82									Quagooted									
83						)E0/ Ot	10.04			UCL to Use	•							
84					9	95% Sti	uents	-ι UCL	43.58			1						
85		late: 0			المراجع الم	h.a •		4 - 050					- ماد			-	0/ 1101	
86	ſ			-							Ip the user to							
87		i nese re					-				idies summar					iaci (2	2002)	
88			an	a Singh	1 and		-				vill not cover a			a data s	ets.			
89						For ac	dition	al insig	nt the user m	hay want to c	consult a stati	stician.						
90									<u> </u>									
91		Note: Fo	-		-						, Johnson, Lo	-			-	nay no	ot be	
92			re	liable.	Chen	n's and	Johns	on's m	ethods provi	de adjustme	ents for posit	vely sk	ewed	data se	ets.			
93																		

	A B C D E	F	G H I J K	L
1	_	ics for Data	Sets with Non-Detects	
2				
3	User Selected Options			
4	Date/Time of Computation 12/22/2015 10:35:42 AM			
5	From File Metals.xls			
6	Full Precision OFF			
7	Confidence Coefficient 95%			
8	Number of Bootstrap Operations 2000			
9				
10				
11	Cu			
12				
13		General		
14	Total Number of Observations	6	Number of Distinct Observations	6
15			Number of Missing Observations	0
16	Minimum	5.5	Mean	20.42
17	Maximum	30	Median	23.5
18	SD	9.861	Std. Error of Mean	4.026
19	Coefficient of Variation	0.483	Skewness	-0.724
20				
21			e collected using ISM approach, you should use	
22			SM (ITRC, 2012) to compute statistics of interest. shev UCL to estimate EPC (ITRC, 2012).	
23		=	nparametric and All UCL Options of ProUCL 5.0	
24		sing the No		
25		Normal (	GOF Test	
26	Shapiro Wilk Test Statistic	0.895	Shapiro Wilk GOF Test	
27	5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
28	Lilliefors Test Statistic	0.248	Lilliefors GOF Test	
29 30	5% Lilliefors Critical Value	0.362	Data appear Normal at 5% Significance Level	
31	Data appea	r Normal at	5% Significance Level	
32				
33	Ass	uming Norr	nal Distribution	
34	95% Normal UCL		95% UCLs (Adjusted for Skewness)	
35	95% Student's-t UCL	28.53	95% Adjusted-CLT UCL (Chen-1995)	25.77
36			95% Modified-t UCL (Johnson-1978)	28.33
37				
3/		Gamma	GOF Test	
38	A-D Test Statistic	0.487	Anderson-Darling Gamma GOF Test	
	A-D Test Statistic 5% A-D Critical Value	0.487 0.701	Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	Level
38 39 40				Level
38 39	5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance	
38 39 40 41	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.701 0.266 0.334	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test	
38 39 40 41 42	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.701 0.266 0.334	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	
38       39       40       41       42       43	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.701 0.266 0.334 Gamma Dis	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	
<ul> <li>38</li> <li>39</li> <li>40</li> <li>41</li> <li>42</li> <li>43</li> <li>44</li> </ul>	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.701 0.266 0.334 Gamma Dis	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level	
38       39       40       41       42       43       44       45	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear	0.701 0.266 0.334 Gamma Dis	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level Statistics k star (bias corrected MLE) Theta star (bias corrected MLE)	Level 1.888 10.81
38       39       40       41       42       43       44       45       46	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear k hat (MLE)	0.701 0.266 0.334 Gamma Dis Gamma 3.554	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level Statistics k star (bias corrected MLE) Theta star (bias corrected MLE) nu star (bias corrected)	Level 1.888 10.81 22.66
38         39         40         41         42         43         44         45         46         47	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear k hat (MLE) Theta hat (MLE)	0.701 0.266 0.334 Gamma Dis Gamma 3.554 5.745	Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level Statistics k star (bias corrected MLE) Theta star (bias corrected MLE)	Level 1.888 10.81

	A	В	С	D		F		F	G	Гн			·I	-	к	1
51	Α		-	usted Leve	el of	_	ance	0.0122	u	1 11		Ad	justed Chi			10.27
52																
53							As	suming Gam	ma Distribu	ition						
54	g	5% Approx	imate Gamn	na UCL (u	se w	hen n>=	=50))	36.05		95% Ad	ljusted (	Gamm	a UCL (us	e when	n<50)	45.06
55																
56								Lognormal	GOF Test							
57				Shapiro V	Vilk 1	Fest Sta	tistic	0.835		Sha	oiro Will	k Logi	normal GC	OF Test	,	
58			5%	Shapiro W	/ilk C	Critical V	/alue	0.788		Data appea	r Logno	ormal a	at 5% Sign	ificance	e Level	
59				Lillief	ors 7	Fest Sta	tistic	0.242		Lil	liefors L	ogno	rmal GOF	Test		
60				5% Lillief	ors C	Critical V	/alue	0.362		Data appea	r Logno	ormal a	at 5% Sign	ificance	e Level	
61						Data ap	opear	r Lognormal a	at 5% Signi	ficance Leve	l					
62																
63								Lognormal	Statistics							
64				Minimun	n of L	ogged	Data	1.705					Mean o	of logge	d Data	2.869
65				Maximun	n of L	ogged	Data	3.401					SD o	of logge	d Data	0.663
66								11								
67							Assi	uming Logno	rmal Distrib	oution						
68						95% H-	UCL	54.51			(	90% C	Chebyshev	' (MVUE	E) UCL	38.12
69			95%	6 Chebysł	nev (	MVUE)	UCL	45.84			97	′.5% C	Chebyshev	' (MVUE	E) UCL	56.55
70			99%	6 Chebysł	nev (	MVUE)	UCL	77.6								
71								I								
72						Nonpa	rame	etric Distribut	ion Free U	CL Statistics						
73				Data ap	opea	r to follo	ow a	Discernible [	Distribution	at 5% Signif	icance l	Level				
74																
75						No	onpa	rametric Dist	ribution Fre	e UCLs						
76					95	% CLT	UCL	27.04					95% 、	Jackknif	e UCL	28.53
77			959	% Standar	d Bo	otstrap	UCL	26.44					95% Bo	ootstrap	-t UCL	27.29
78				95% Hall	's Bo	otstrap	UCL	25.11			ç	95% P	ercentile E	Bootstra	p UCL	26.5
79				95% BC	A Bo	otstrap	UCL	25.83								
80			90% (	Chebyshev	/(Me	an, Sd)	UCL	32.49			959	% Che	ebyshev(N	lean, So	d) UCL	37.96
81			97.5% (	Chebyshev	/(Me	an, Sd)	UCL	45.56			99	% Che	ebyshev(N	lean, So	d) UCL	60.47
82																
83								Suggested	UCL to Use	)						
84				95%	Stu	dent's-t	UCL	28.53								
85																
86			-	-				6 UCL are pro								
87		These ree				-		sults of the sir				-	-	-	2002)	
88			and Sing	h and Sin	gh (2	2003). H	owev	ver, simulatio	ns results w	ill not cover a	all Real	World	data sets			
89				Fo	or ad	ditional	insig	ht the user m	ay want to o	consult a stat	istician.					
90																
91		Note: Fo		-				dence limits	· ·		-			) may n	ot be	
92			reliable.	Chen's a	and J	lohnson	n's m	ethods provid	de adjustme	ents for posit	vely ske	ewed	data sets.			
93																

	A B C D E	F	GHIJK	L
1		ics for Data	Sets with Non-Detects	
2				
3	User Selected Options			
4	Date/Time of Computation 12/22/2015 10:36:23 AM			
5	From File Metals.xls			
6	Full Precision OFF			
7	Confidence Coefficient 95%			
8	Number of Bootstrap Operations 2000			
9				
10				
11	Ni			
12				
13		General		
14	Total Number of Observations	6	Number of Distinct Observations	6
15			Number of Missing Observations	0
16	Minimum	8.5	Mean	36.92
17	Maximum	56	Median	46
18	SD	20.03	Std. Error of Mean	8.178
19	Coefficient of Variation	0.543	Skewness	-0.832
20				
21		-	e collected using ISM approach, you should use	
22			SM (ITRC, 2012) to compute statistics of interest.	
23		-	shev UCL to estimate EPC (ITRC, 2012).	
24	Chebysnev UCL can be computed u	sing the No	nparametric and All UCL Options of ProUCL 5.0	
25		Nameal		
26	Chaning Wills Tast Otatistic		GOF Test Shapiro Wilk GOF Test	
27	Shapiro Wilk Test Statistic	0.834	-	
28	5% Shapiro Wilk Critical Value Lilliefors Test Statistic	0.788	Data appear Normal at 5% Significance Level Lilliefors GOF Test	
29	5% Lilliefors Critical Value	0.280	Data appear Normal at 5% Significance Level	
30			5% Significance Level	
31	Data appea			
32	۵۵۵	uming Norr	nal Distribution	
33	95% Normal UCL		95% UCLs (Adjusted for Skewness)	
34	95% Student's-t UCL	53.39	95% Adjusted-CLT UCL (Chen-1995)	47.4
35			95% Modified-t UCL (Johnson-1978)	52.93
36				02.00
37		Gamma (	GOF Test	
38	A-D Test Statistic	0.709	Anderson-Darling Gamma GOF Test	
39 40	5% A-D Critical Value	0.702	Data Not Gamma Distributed at 5% Significance Leve	
40	K-S Test Statistic	0.343	Kolmogrov-Smirnoff Gamma GOF Test	
41 42	5% K-S Critical Value	0.335	Data Not Gamma Distributed at 5% Significance Leve	l
42			ed at 5% Significance Level	
43				
44		Gamma	Statistics	
45	k hat (MLE)	2.627	k star (bias corrected MLE)	1.425
40	Theta hat (MLE)	14.05	Theta star (bias corrected MLE)	25.91
47	nu hat (MLE)	31.52	nu star (bias corrected)	17.1
40	MLE Mean (bias corrected)	36.92	MLE Sd (bias corrected)	30.93
49 50	· · · · ·		Approximate Chi Square Value (0.05)	8.74
50			••• • • • • • • • • • • • • • • • • • •	

	A		В	τ	С	<u> </u>	D	1	E	F	G	Н	<u> </u>			J	1	К	
51	Α		0	<u> </u>	-	usted	_	of Sign	ificance	-	u			Ad	ljuste	•	Squa	re Value	6.697
52																			
53									As	suming Gan	nma Distribu	ition							
54		95% A	pproxir	nate	Gamm	a UC	L (use	when	n>=50))	72.21		95% Ad	justed (	Gamn	na UC	CL (us	e whe	en n<50)	94.24
55													-			-			
56										Lognorma	I GOF Test								
57						Shapi	ro Wilk	Test	Statistic			Shap	oiro Wil	k Log	norm	al GC	)F Te	st	
					5% इ	Shapi	ro Wilk	Critic	al Value	0.788		Data appea		-					
58									Statistic			Lil	liefors l	_ogno	ormal	GOF	Test		
59 60					!	5% Li	lliefors	Critic	al Value			Data appea		-				ce Level	
60											at 5% Signi	ficance Leve	-	-		- J			
61											g								
62										Lognorma	al Statistics								
63						Mini	mum of	f I oaa	ed Data	-					N	lean c	of load	ged Data	3.406
64									ed Data									ged Data	0.786
65								2099		1.020						000	, logs	jou Dulu	0.700
66									<u>Δ</u> εε	uming Logn	ormal Distrik	oution							
67								95%	H-UCL					90% (	Cheh	vshov	(M\/I	JE) UCL	75.65
68					95%	Cho	hychov		IE) UCL							•	•	JE) UCL	115.7
69							•	•	IE) UCL	161.3			57		Cheb	yanev	(101 0 0		110.7
70					9970		bysnev			101.5									
71								No	noram	otrio Distribu	tion Fron I l	CL Statistics							
72						Dat			•			at 5% Signifi	icance						
73							a appe			Discernible	Distribution	at 5 /6 Signin	cance	Levei					
74									Nonno	rametric Dis	tribution Era								
75								NE 0/ C								050/	lookk	nife UCL	53.39
76					050	/ Stor			ap UCL									ap-t UCL	50.28
77									ap UCL					)E0/ F				rap UCL	49.33
78									ap UCL	45.42				90% F	Perce		booisi		49.33
79					000/ 0				•				05		- h. ( - l				70 50
80						-										`		Sd) UCL	72.56
81				9/	.5%0		SI EV (IVI	ean, c	Sd) UCL	87.99			99	/0 UN	enysi		edil,	Sd) UCL	118.3
82										Quagaated									
83											UCL to Use	•							
84							30% St	uuent	s-t UCL	53.39			1						
85		N1-+	0						-1 - 0 - 0					- ماد					
86					-							lp the user to							
87		Ihe	ese rec					-				idies summar				-		i (2002)	
88				and	a Singh	n and		-				vill not cover a			a data	a sets.	-		
89							⊦or a	dditio	nal insig	nt the user n	hay want to o	consult a stati	istician.						
90				<u> </u>							,								
91		No	te: For	-		-						, Johnson, Lo	-				) may	not be	
92				re	liable.	Che	n's and	John	son's m	ethods provi	de adjustme	ents for posit	vely sk	ewed	data	sets.			
93																			

	A B C	DE	F	G H I J K	L
1			ics for Data	Sets with Non-Detects	
2					
3	User Selected Options				
4	Date/Time of Computation	12/22/2015 10:37:06 AM			
5	From File	Metals.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
10					
11	V				
12					
13			General	Statistics	
14	Total	Number of Observations	6	Number of Distinct Observations	6
15				Number of Missing Observations	0
16		Minimum	12	Mean	43.5
17		Maximum	68	Median	47.5
18		SD	23.04	Std. Error of Mean	9.405
		Coefficient of Variation	0.53	Skewness	-0.421
19					
20	Note: Sam	ole size is small (e.g., <10	), if data ar	e collected using ISM approach, you should use	
21	-		-	SM (ITRC, 2012) to compute statistics of interest.	
22		-		rshev UCL to estimate EPC (ITRC, 2012).	
23			-	nparametric and All UCL Options of ProUCL 5.0	
24					
25			Normal (	GOF Test	
26	Si	hapiro Wilk Test Statistic	0.917	Shapiro Wilk GOF Test	
27		napiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
28 29		Lilliefors Test Statistic	0.169	Lilliefors GOF Test	
20	59	% Lilliefors Critical Value	0.362	Data appear Normal at 5% Significance Level	
30	-			5% Significance Level	
31					
32		Ass	umina Nori	nal Distribution	
33	95% No	ormal UCL		95% UCLs (Adjusted for Skewness)	
34		95% Student's-t UCL	62.45		57.24
35			-		62.18
36					
37			Gamma	GOF Test	
38		A-D Test Statistic	0.4	Anderson-Darling Gamma GOF Test	
39		5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance	Level
40		K-S Test Statistic	0.218	Kolmogrov-Smirnoff Gamma GOF Test	
41		5% K-S Critical Value	0.334	Detected data appear Gamma Distributed at 5% Significance	Level
42				stributed at 5% Significance Level	
43					
44			Gamma	Statistics	
45		k hat (MLE)	3.141	k star (bias corrected MLE)	1.682
46		Theta hat (MLE)	13.85		25.87
47		nu hat (MLE)	37.69		20.18
48	N A I	E Mean (bias corrected)	43.5		33.54
49	IVIL		<del>т</del> Ј.Ј		10.98
50					10.30

	A	В	С	<u> </u>	D		E	-	F	G	Тн	<u>г</u>		.l	Т	К	1
51			-	\djuste	ed Level	of		-	0.0122	ŭ			Ad	justed Chi	Squar		8.642
52																Į	
53								As	suming Gam	ma Distribu	ution						
54	ç	5% Approx	kimate Gar	mma l	JCL (use	e wl	hen n>	=50))	79.92		95% Ac	ljusted (	Gamm	a UCL (us	e whe	en n<50)	101.6
55																	
56									Lognormal	GOF Test							
57				Sh	apiro Wi	lk T	est Sta	atistic	0.872		Sha	oiro Will	k Logi	normal GC	)F Tes	st	
58			5	% Sha	apiro Wil	lk C	ritical \	Value	0.788		Data appea	r Logno	ormal a	at 5% Sign	ifican	ce Level	
59					Lilliefo	rs T	est Sta	atistic	0.242		Lil	liefors l	ogno	rmal GOF	Test		
60				5%	Lilliefor	rs C	ritical	Value	0.362		Data appea	r Logno	ormal a	at 5% Sign	ifican	ce Level	
61							Data a	ppear	Lognormal	at 5% Signi	ificance Leve	l					
62																	
63									Lognorma	Statistics							
64				Μ	inimum	of L	ogged	Data	2.485					Mean o	of logg	ed Data	3.605
65				Ma	aximum	of L	ogged	Data	4.22					SD o	of logg	ed Data	0.696
66									I							I.	
67								Assi	uming Logno	rmal Distrit	oution						
68							95% H	-UCL	125.3			9	90% C	Chebyshev	′ (MVL	JE) UCL	82.75
69			9	5% C	hebyshe	ev (l	MVUE)	UCL	99.95			97	′.5% C	Chebyshev	' (MVL	JE) UCL	123.8
70			9	9% C	hebyshe	ev (l	MVUE)	UCL	170.7								
71																	
72							Nonpa	arame	etric Distribut	tion Free U	CL Statistics						
73				[	Data app	bear	r to foll	low a	Discernible I	Distribution	at 5% Signif	icance	Level				
74																	
75							N	lonpa	rametric Dist	ribution Fre	e UCLs						
76						95	% CLT	UCL	58.97							nife UCL	62.45
77			ç		standard		-		57.89							ap-t UCL	60.12
78				95	% Hall's	Во	otstrap	UCL	53.93			ç	95% P	ercentile E	Bootsti	rap UCL	57.17
79				9	5% BCA	Во	otstrap	UCL	56.33								
80					byshev(				71.71					ebyshev(N	-	,	84.49
81			97.5%	% Che	byshev(	Mea	an, Sd)	UCL	102.2			99	% Ch	ebyshev(N	lean, S	Sd) UCL	137.1
82																	
83									Suggested	UCL to Use	•						
84					95% \$	Stuc	dent's-t	UCL	62.45								
85																	
86				-	-						elp the user to						
87		These re					-				udies summa		-	-		(2002)	
88			and Si	ingh a	-		-				vill not cover a			data sets	•		
89					For	ado	ditional	l insig	ht the user m	ay want to	consult a stat	istician.					
90																	
91		Note: Fo		-	-						, Johnson, L	-			) may	not be	
92			reliab	le. C	nen's ar	nd J	ohnso	n's m	ethods provi	de adjustmo	ents for posit	vely ske	ewed	data sets.			
93																	

	A B C D E	F	G H I J K	L
1		ics for Data	Sets with Non-Detects	
2				
3	User Selected Options			
4	Date/Time of Computation 12/22/2015 10:37:43 AM			
5	From File Metals.xls			
6	Full Precision OFF			
7	Confidence Coefficient 95%			
8	Number of Bootstrap Operations 2000			
9				
10				
11	Zn			
12				
13			Statistics	
14	Total Number of Observations	6	Number of Distinct Observations	6
15			Number of Missing Observations	0
16	Minimum	16	Mean	51.67
17	Maximum	92	Median	55
18	SD	32.18	Std. Error of Mean	13.14
19	Coefficient of Variation	0.623	Skewness	-0.0317
20				
21	· · · · ·	-	e collected using ISM approach, you should use	
22			SM (ITRC, 2012) to compute statistics of interest.	
23		-	shev UCL to estimate EPC (ITRC, 2012).	
24	Chebyshev UCL can be computed u	sing the No	nparametric and All UCL Options of ProUCL 5.0	
25		Nermeeld	GOF Test	
26	Shapiro Wilk Test Statistic	0.891	Shapiro Wilk GOF Test	
27	5% Shapiro Wilk Critical Value	0.891	Data appear Normal at 5% Significance Level	
28	Lilliefors Test Statistic	0.788	Lilliefors GOF Test	
29	5% Lilliefors Critical Value	0.220	Data appear Normal at 5% Significance Level	
30			5% Significance Level	
31				
32	Δος	suming Nor	nal Distribution	
33	95% Normal UCL	Juning Heri	95% UCLs (Adjusted for Skewness)	
34	95% Student's-t UCL	78.14	95% Adjusted-CLT UCL (Chen-1995)	73.1
35			95% Modified-t UCL (Johnson-1978)	78.11
36				
37		Gamma	GOF Test	
37 38	A-D Test Statistic	<b>Gamma</b>		
37 38 39	A-D Test Statistic 5% A-D Critical Value		GOF Test	e Level
37 38 39 40		0.472	GOF Test Anderson-Darling Gamma GOF Test	e Level
37 38 39 40 41	5% A-D Critical Value	0.472 0.703	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	
37 38 39 40 41 42	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.472 0.703 0.269 0.335	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significand Kolmogrov-Smirnoff Gamma GOF Test	
37 38 39 40 41 42 43	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.472 0.703 0.269 0.335	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significanc Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	
37 38 39 40 41 42 43 44	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.472 0.703 0.269 0.335 Gamma Dis	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significanc Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance	
37 38 39 40 41 42 43 44 45	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value	0.472 0.703 0.269 0.335 Gamma Dis	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level	
37           38           39           40           41           42           43           44           45           46	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear	0.472 0.703 0.269 0.335 Gamma Dis Gamma	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level Statistics	e Level
37           38           39           40           41           42           43           44           45           46           47	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear k hat (MLE)	0.472 0.703 0.269 0.335 Gamma Dis Gamma 2.466	GOF Test Anderson-Darling Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance Kolmogrov-Smirnoff Gamma GOF Test Detected data appear Gamma Distributed at 5% Significance stributed at 5% Significance Level Statistics k star (bias corrected MLE)	te Level
37           38           39           40           41           42           43           44           45           46	5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Detected data appear k hat (MLE) Theta hat (MLE)	0.472 0.703 0.269 0.335 <b>Gamma Di</b> <b>Gamma</b> 2.466 20.95	GOF Test Content of the star (bias corrected MLE) Content of the star (bias co	te Level 1.344 38.44

	А	В		<b>C</b>		D	1	E	F	G	Н			.I		К	
51	Λ	<u> </u>		-		-	Sigr	ificance	-	<u> </u>			Ad	usted Chi	Squar		6.108
52																	
53								As	suming Gan	nma Distribu	ition						
54	95	% Approx	imate G	amma	UCL	(use w	vhen	n>=50))	103.5		95% Ad	justed (	Gamm	a UCL (u	se whe	n n<50)	136.4
55																	
56									Lognorma	I GOF Test							
57				Sł	hapiro	o Wilk <sup>-</sup>	Test	Statistic	0.852		Sha	oiro Will	k Logi	normal G	OF Tes	st	
58				5% Sh	napiro	Wilk C	Critic	al Value	0.788		Data appea	r Logno	rmal a	at 5% Sigi	nificanc	e Level	
59					Lill	iefors -	Test	Statistic	0.255		Lil	liefors L	.ogno	rmal GOF	Test		
60				5%	% Lilli	iefors (	Critic	al Value	0.362		Data appea	r Logno	rmal a	at 5% Sigi	nificanc	e Level	
61							Data	a appea	r Lognormal	at 5% Signi	ficance Leve						
62																	
63									Lognorma	I Statistics							
64				Ν	Minim	um of l	Logg	ed Data	2.773					Mean	of logg	ed Data	3.729
65				Ν	laxim	um of l	Logg	ed Data	4.522					SD	of logg	ed Data	0.772
66																	
67								Ass	uming Logno	ormal Distrit	oution						
68							95%	H-UCL	180.8			ę	90% C	hebyshev	/ (MVU	E) UCL	102.6
69				95% (	Cheby	yshev (	(MVL	JE) UCL	125.1			97	.5% C	hebyshe	/ (MVU	E) UCL	156.4
70				99% (	Cheby	yshev (	(MVL	JE) UCL	217.8								
71																	
72							No	nparam	etric Distribu	tion Free U	CL Statistics						
73					Data	appea	ar to	follow a	Discernible	Distribution	at 5% Signif	icance l	Level				
74																	
75								Nonpa	rametric Dis	tribution Fre	e UCLs						
76						95	5% C	LT UCL	73.28					95%	Jackkn	ife UCL	78.14
77				95% \$	Stand	dard Bo	ootst	rap UCL	70.93					95% B	ootstra	p-t UCL	80.95
78				95	5% H	all's Bo	ootst	rap UCL	67.07			ç	95% P	ercentile	Bootstr	ap UCL	71.17
79				9	95% E	BCA Bo	ootst	rap UCL	69.83								
80			90	0% Che	ebysł	nev(Me	ean, S	Sd) UCL	91.08			959	% Che	byshev(N	lean, S	6d) UCL	108.9
81			97.5	5% Che	ebysł	nev(Me	ean, S	Sd) UCL	133.7			999	% Che	byshev(N	lean, S	3d) UCL	182.4
82																	
83									Suggested	UCL to Use	)						
84					9	5% Stu	udent	's-t UCL	78.14								
85																	
86	N	ote: Sugge	estions r	regardi	ing th	e selec	ction	of a 95%	6 UCL are pr	ovided to he	Ip the user to	select	the mo	ost approp	oriate 9	5% UCL	
87		These ree	commen	ndation	is are	based	d upo	n the res	sults of the si	mulation stu	idies summai	ized in a	Singh	, Singh, a	nd laci	(2002)	
88			and	Singh a	and S	Singh (2	2003	). Howe	ver, simulatio	ons results w	vill not cover a	all Real	World	data sets	i.		
1						For ad	ditio	nal insig	ht the user n	nay want to o	consult a stat	istician.					
89																	
89 90																	
		Note: Fo	r highly	negati	ively-	skewe	ed da	ta, confi	dence limits	(e.g., Chen	, Johnson, L	ognorm	al, an	d Gamma	) may	not be	
90		Note: Fo			-						, Johnson, Lu ents for posit	-				not be	

# **APPENDIX D**

**Boring Logs** 



BORING/	WELL NUI	MBER		B7			
PROJECT	Comn	nercial Pro	perty			OWNEF	ł
LOCATIO				Agoura Hills, C	A	PROJEC	TNUMBER
DATE DR	ILLED	June 11,	2015			TOTAL	<b>DEPTH OF HOLE</b> 15 Feet
SURFACE	ELEVATIO	ON				DEPTH	TO WATER 8 Feet
SCREEN:	DIA.			L	ENGTH		SLOT SIZE
CASING: I	DIA.			L	ENGTH		ТҮРЕ
DRILLING	COMPAN	Y	Aztech Dr	illing		DRILL N	METHOD HSA
DRILLER	Gilber	rt –				LOG BY	Dan Louks
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAME	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW	(USCS)	
5			2.4	B7-5		SM	Silty SAND; dark brown, very fine grained, loose, some concrete and brick debris, no odor.
10			<1	B7-10	5/7/10	CL	Silty CLAY; brown, low plasticity, 10% fine gravel, moist, no odor.
15			<1	B7-15	13/15/18	CL	Silty CLAY; dark brown, low plasticity, dense, moist, no odor.
20							Set temporary casing to allow for groundwater accumulation. Groundwater accumulated at about 8 feet bgs. Collect groundwater sample, seal with bentonite to 5 feet. Install Soil Gas Probe SG1 at 5 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.



BORING/	WELL NUN	MBER		B8			
PROJECT	Comn	nercial Pro	perty			OWNER	L
LOCATION	N 29	508 Roads	ide Drive,	Agoura Hills, C	A	PROJEC	T NUMBER
DATE DRI	LLED	June 11,	2015			TOTAL	DEPTH OF HOLE 20 Feet
SURFACE	ELEVATIO	ON				DEPTH	TO WATER
SCREEN:	DIA.			L	ENGTH		SLOT SIZE
CASING: I	DIA.			L	ENGTH		ТҮРЕ
DRILLING	COMPAN	Y	Aztech Dr	illing		DRILL	METHOD HSA
DRILLER	Gilber	t				LOG BY	Dan Louks
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAME	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW	(USCS)	
5			1.2	B8-5		SM	Silty SAND; dark brown, very fine grained, loose, 10% fine gravel, no odor.
10			<1	B8-10	8/13/18	ML	Sandy SILT; reddish gray, very fine to fine sand, low plasticity, dense, some clay, dry, no odor.
15			<1	B8-15	10/18/26	CL	Silty CLAY; brown, low plasticity, dense, some gray staining, moist, no odor. Sampler wet, no water accumulation.
20			<1	B8-20	10/24/35	CL	Silty CLAY; brown, low plasticity, very moist, no odor. Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 5 feet. Install Soil Gas Probe SG2 at 5 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.



BORING/	WELL NUN	MBER		B9				
PROJECT	Comn	nercial Pro	perty			OWNER	R	
LOCATION	N 29	508 Roads	side Drive,	Agoura Hills, C	A	PROJEC	CT NUMBER	
DATE DRI	LLED	June 11,	2015			TOTAL DEPTH OF HOLE20 Feet		
SURFACE	ELEVATIO	ON				DEPTH	TO WATER	
SCREEN:	DIA.			L	ENGTH		SLOT SIZE	
CASING: I	DIA.			L	ENGTH		ТҮРЕ	
DRILLING	COMPAN	Y	Aztech Dr	illing		DRILL	METHOD HSA	
DRILLER	Gilber	ť				LOG BY	Dan Louks	
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAMI	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	
	PIPE	FILL		NUMBER	BLOW	(USCS)		
5			1.1	B9-5		SM	Silty SAND; brown, very fine grained, loose, 20% fine gravel, dry, no odor.	
10			<1	B9-10	10/14/18	CL	Silty CLAY; brown, low plasticity, hard, no odor.	
15			<1	B9-15	28/24/20	CL	Sandy CLAY; brown, low plasticity, dense, 25% fine to coarse gravel, dry, no odor.	
20			<1	B9-20	50/50	SM	Silty SAND; brown, very fine to fine grained, 25% fine gravel, some clay, very hard, no odor. Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 10 feet. Install Soil Gas Probe SG3 at 10 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.	



BORING/	WELL NUN	MBER	E	310					
PROJECT	Comn	nercial Pro	perty			OWNER			
LOCATION	N 29	508 Roads	ide Drive, .	Agoura Hills, C	A	PROJEC	T NUMBER		
DATE DRI	ILLED	June 11,	2015			TOTAL	TOTAL DEPTH OF HOLE 20 Feet		
SURFACE	ELEVATIO	ON				DEPTH	TO WATER 12 Feet		
SCREEN:	DIA.			L	ENGTH		SLOT SIZE		
CASING: I	DIA.			L	ENGTH		ТҮРЕ		
DRILLING	COMPAN	Y	Aztech Dr	illing		DRILL N	METHOD HSA		
DRILLER	Gilber	t				LOG BY	Dan Louks		
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAME	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)		
	PIPE	FILL		NUMBER	BLOW	(USCS)			
5			<1	B10-5	18/20/29	SM	Silty SAND; brown, very fine grained, very hard, some fine gravel, dry, no odor.		
10			<1	B10-10	50/50	SM	Silty SAND; brown, very fine grained, very hard, 20% fine gravel, dry, no odor.		
15			<1	B10-15	17/22/32	SM	Silty SAND; brown, very fine grained, hard, some clay, dry, no odor.		
20			<1	B10-20	50/50	ML	SILT; brown, low plasticity, 20% fine gravel, some sand, very hard, no odor. Set temporary casing to allow for groundwater accumulation. Groundwater accumulated at about 12 feet bgs. Collect groundwater sample, seal with bentonite to 5 feet. Install Soil Gas Probe SG4 at 5 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.		



BORING/	WELL NUI	MBER	I	311			
PROJECT	Comn	nercial Pro	perty			OWNE	R
LOCATIO				Agoura Hills, C	A	PROJEC	CT NUMBER
DATE DRILLED June 11, 2015							<b>DEPTH OF HOLE</b> 20 Feet
SURFACE	ELEVATIO	ON				DEPTH	TO WATER
SCREEN:	DIA.			L	ENGTH		SLOT SIZE
CASING:	DIA.			L	ENGTH		ТҮРЕ
DRILLING	G COMPAN	Y	Aztech Dr	illing		DRILL	METHOD HSA
DRILLER	Gilber	t –				LOG BY	Dan Louks
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAMI	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW	(USCS)	
5							
							Silty SAND Fill.
10							Sity SAND Fill.
10							
15			<1	B11-15	18/20/25	CL	Silty CLAY; light brown, low plasticity, hard, no odor.
20			<1	B11-20	15/22/25	ML	Clayey, Sandy, SILT; brown, low plasticity, very hard, no
20			~1	D11-20	15/22/25	IVIL	odor.
							Set temporary casing to allow for groundwater
							Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 10 feet. Install Soil Gas Probe SG5 at 10 feet bgs. Seal with
							bentonite. Sample soil gas on 6/15/15.



BORING/	WELL NU	MBER	E	812				
PROJECT	Comn	nercial Pr	operty			OWNE	R	
LOCATION				Agoura Hills, C	A	PROJECT NUMBER		
	DATE DRILLED June 11,			0 ,		TOTAL DEPTH OF HOLE 20 Feet		
SURFACE							TO WATER	
SCREEN:				L	ENGTH		SLOT SIZE	
CASING: I	-				ENGTH		ТҮРЕ	
DRILLING	-	Y	Aztech Dr			DRILL	METHOD HSA	
DRILLER	Gilber			0		LOG BY		
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAM	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	
(PEET)	PIPE	FILL		NUMBER	BLOW	(USCS)	(COLOR, TEXTORE, STRUCTURES)	
		TILL		NUMBER	DLOW	(0303)		
5								
6			2.4	B12-6		CL	Silty CLAY; dark gray, medium plasticity, very slight petroleum odor.	
10			1.2	B12-10	15/21/30	CL	Gravelly CLAY; gray/brown, low plasticity, very fine to coarse gravel, no odor.	
15			0.4	B12-15	12/14/18	CL	Gravelly CLAY; dark gray, low plasticity, very fine to coarse gravel, no odor.	
							Very dense. Refusal at 17 feet – boulder.	
20							Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 15 feet. Install Soil Gas Probe SG6 at 15 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.	



BORING/	WELL NU	MBER	E	313				
PROJECT	Comn	nercial Pro	perty			OWNER	R	
LOCATIO	N 29	508 Roads	ide Drive, .	Agoura Hills, C	A	PROJEC	CT NUMBER	
DATE DR	ILLED	June 11,	2015			TOTAL DEPTH OF HOLE   30 Feet		
SURFACE	ELEVATIO	ON	_			DEPTH TO WATER		
SCREEN:	DIA.			L	ENGTH		SLOT SIZE	
CASING: I	DIA.			L	ENGTH		ТҮРЕ	
DRILLING	COMPAN	Y _	Aztech Dr	illing		DRILL	METHOD HSA	
DRILLER	Gilber	rt				LOG BY	Dan Louks	
DEPTH (FEET)	WELL	CONST	PID (PPM)	SAMI	PLES	SOIL CLASS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	
	PIPE	FILL		NUMBER	BLOW	(USCS)		
5								
10								
15			<1	B13-15	10/15/26	CL	Gravelly, Silty CLAY; dark brown, low plasticity, 20% fine gravel, no odor.	
20			<1	B13-20	15/28/21	SM	Silty SAND; greenish-gray, very fine to fine grained, 25% fine gravel, some clay, no odor.	
25			<1	B13-25	17/25/45	CL	Silty CLAY; brown, low plasticity, very hard, moist, no odor.	
30			<1	B13-30	18/36/50	CL	Silty CLAY; dark gray, low plasticity, semi-consolidated, dry, no odor. Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 10 feet. Install Soil Gas Probe SG7 at 10 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.	

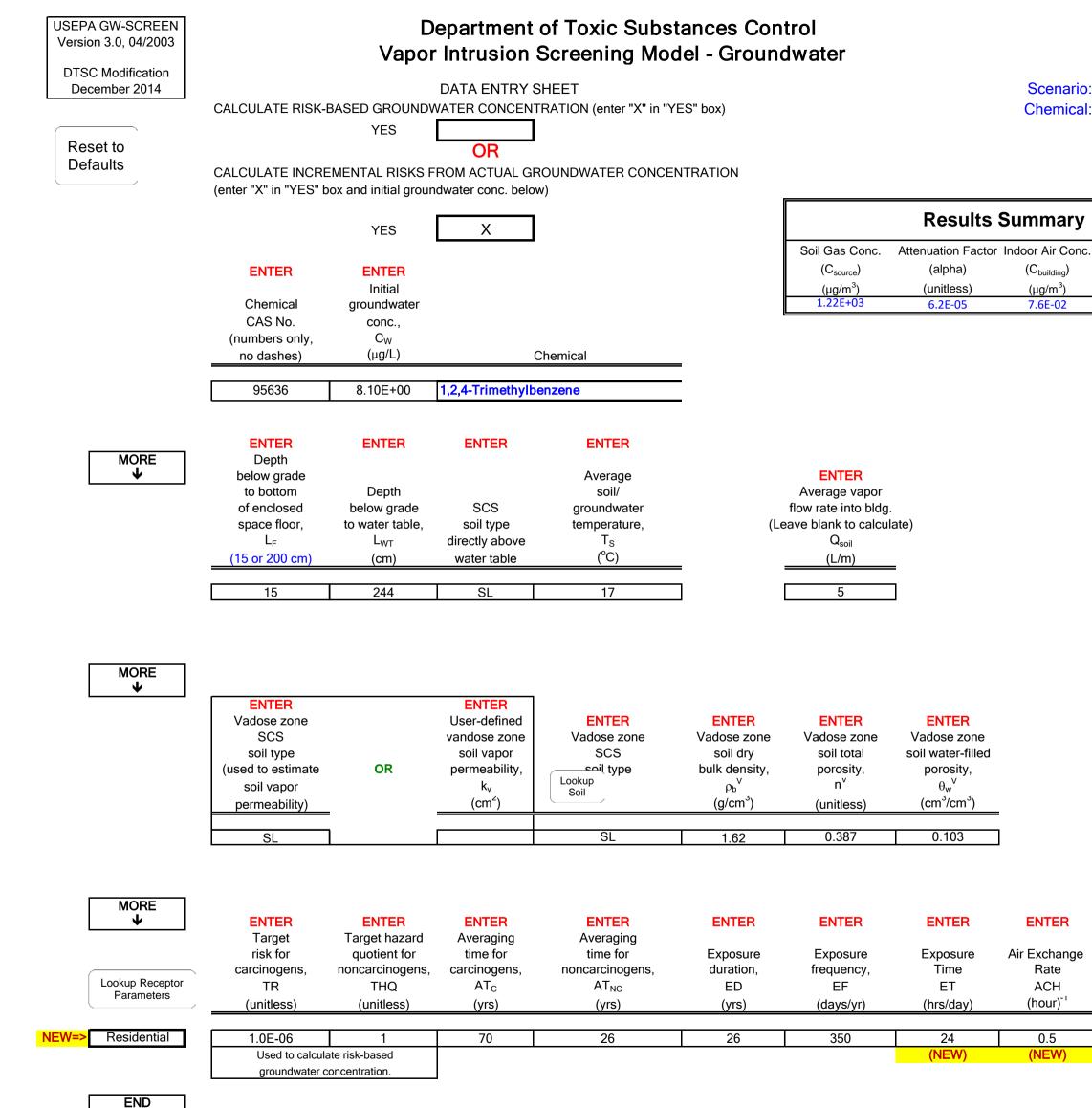


**BORING/WELL NUMBER** B14 PROJECT **Commercial Property OWNER** LOCATION 29508 Roadside Drive, Agoura Hills, CA **PROJECT NUMBER** DATE DRILLED June 11, 2015 **TOTAL DEPTH OF HOLE** 20 Feet **DEPTH TO WATER** SURFACE ELEVATION SCREEN: DIA. LENGTH **SLOT SIZE** CASING: DIA. LENGTH TYPE **DRILLING COMPANY** Aztech Drilling **DRILL METHOD** HSA DRILLER Gilbert LOG BY Dan Louks DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES) DEPTH WELL CONST PID SAMPLES SOIL (FEET) (PPM) CLASS

(1221)	PIPE	FILL	(11.1)	NUMBER	BLOW	(USCS)	
5							
10							Silty SAND Fill.
15			<1	B14-15	11/17/21	ML	Clayey, Sandy, SILT; brown, low plasticity, very hard, no odor.
20			<1	B14-20	12/20/35	CL	Silty CLAY; brown, low plasticity, some very fine sand, hard, no odor. Set temporary casing to allow for groundwater accumulation. No groundwater. Seal with bentonite to 10 feet. Install Soil Gas Probe SG8 at 10 feet bgs. Seal with bentonite. Sample soil gas on 6/15/15.

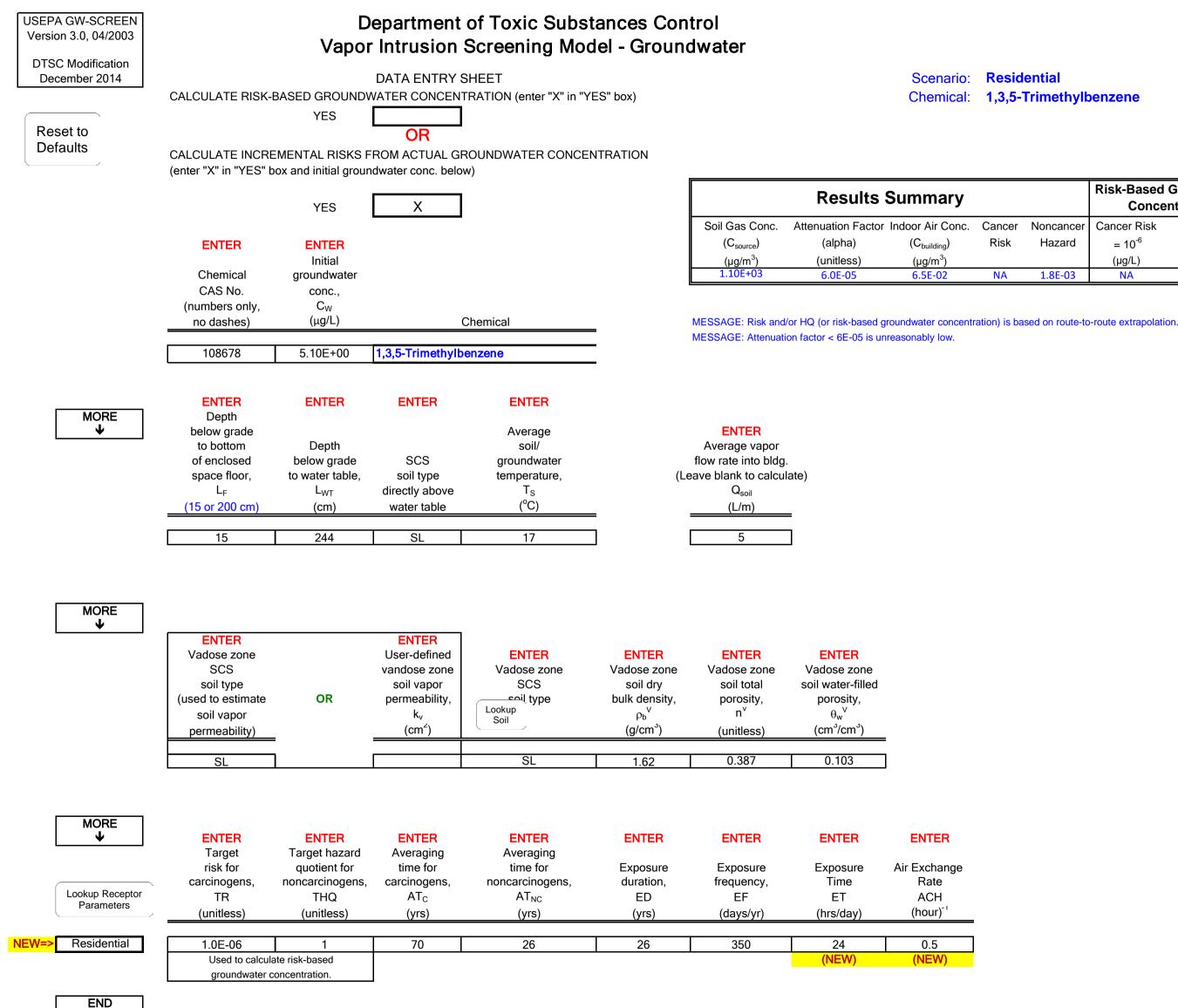
## **APPENDIX E**

## Johnson & Ettinger Model Results Residential Scenario



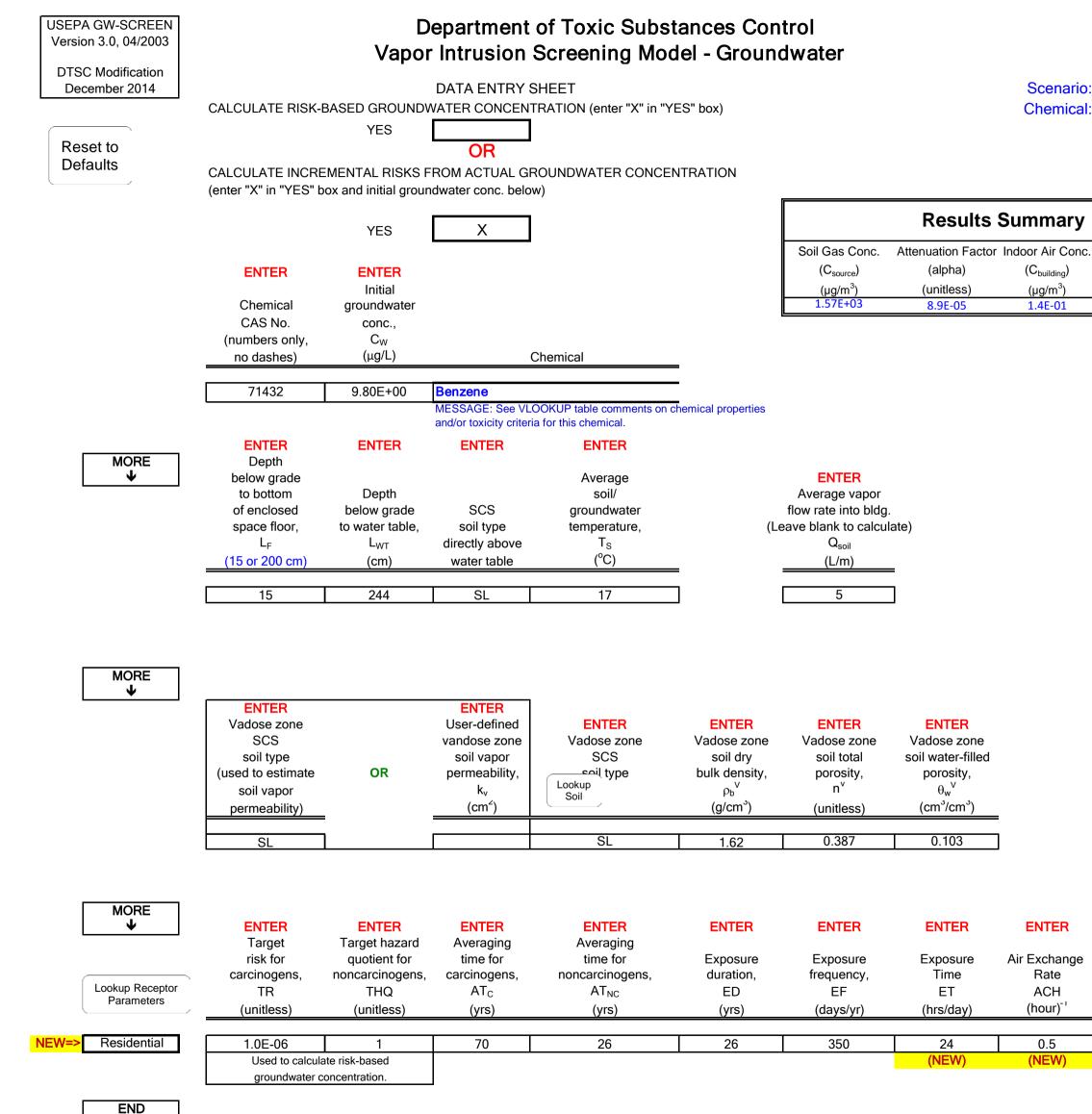
### Scenario: Residential Chemical: 1,2,4-Trimethylbenzene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
7.6E-02	NA	1.0E-02	NA	NA



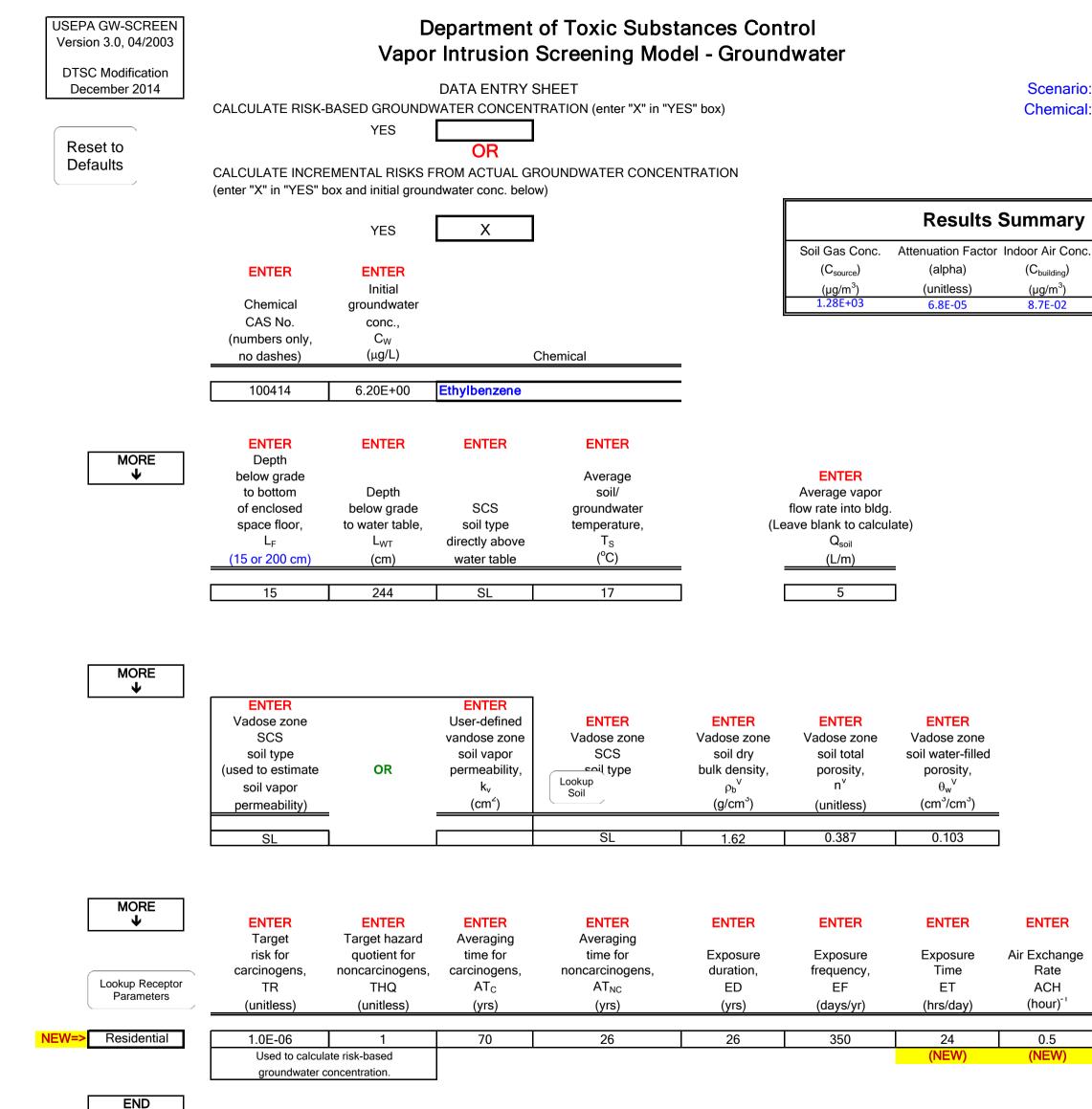
### Scenario: Residential Chemical: 1,3,5-Trimethylbenzene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m³)			(µg/L)	(µg/L)
6.5E-02	NA	1.8E-03	NA	NA



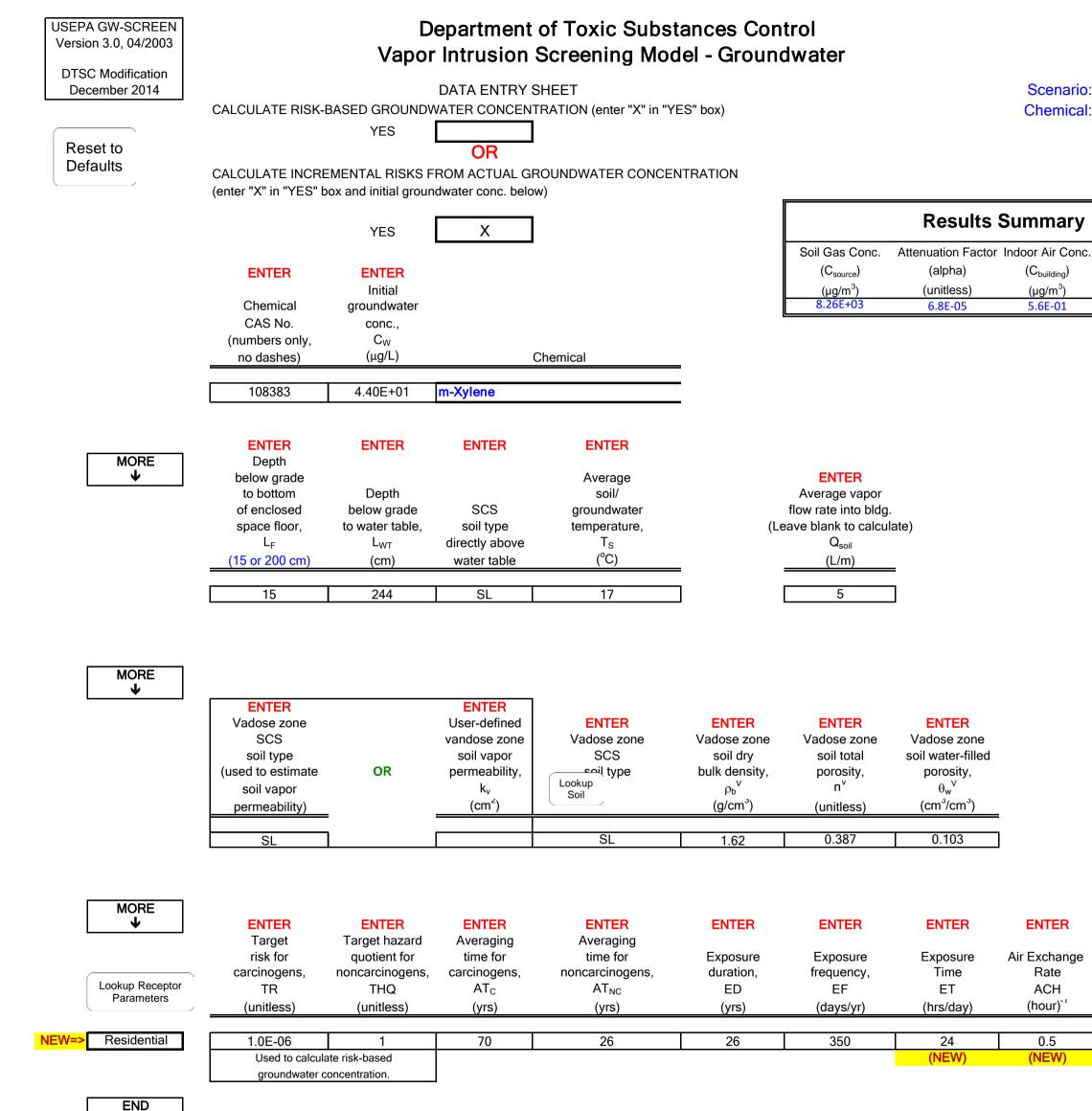
### Scenario: Residential Chemical: Benzene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
1.4E-01	1.4E-06	4.5E-02	NA	NA



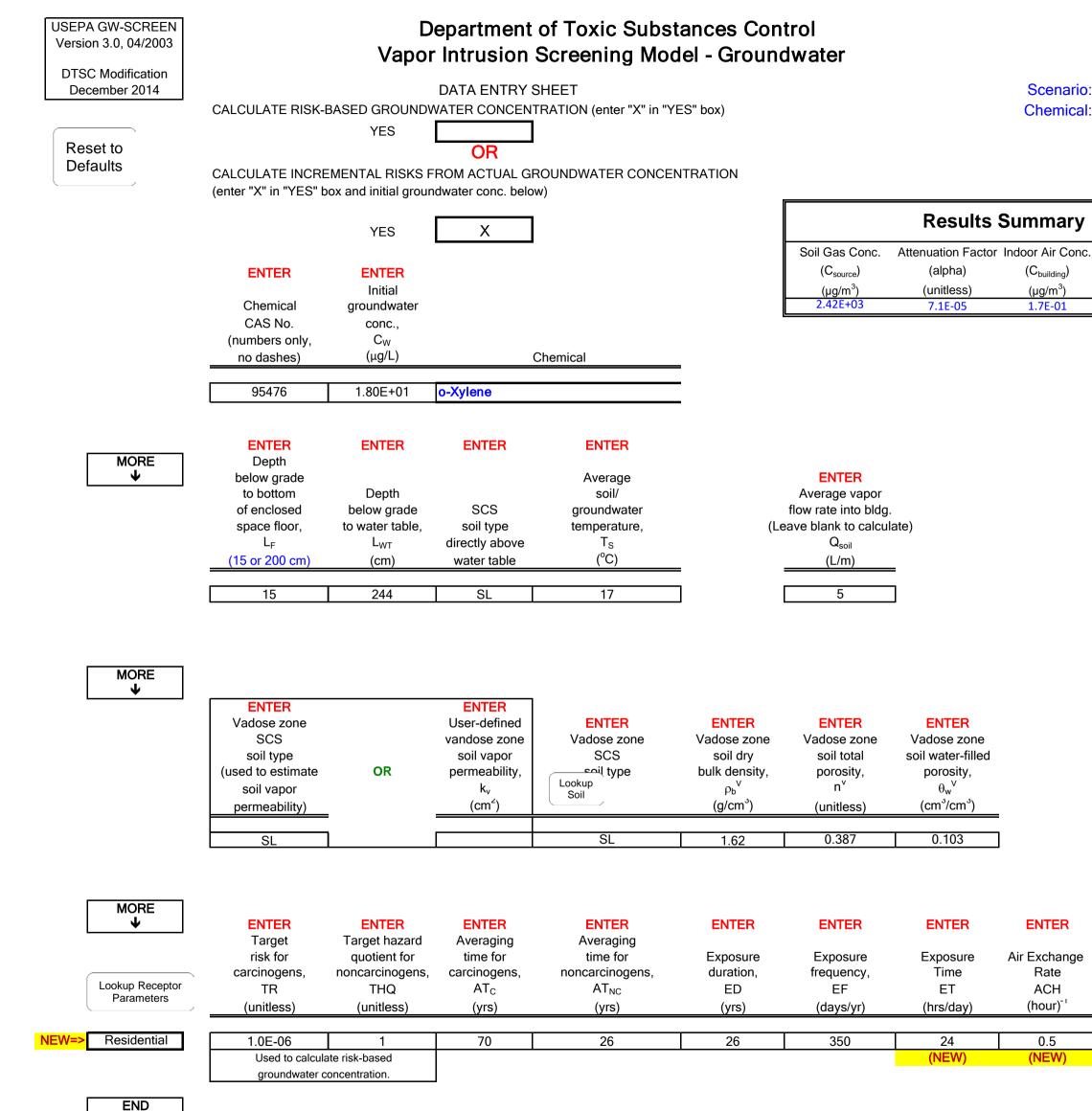
### Scenario: Residential Chemical: Ethylbenzene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
8.7E-02	7.7E-08	8.3E-05	NA	NA



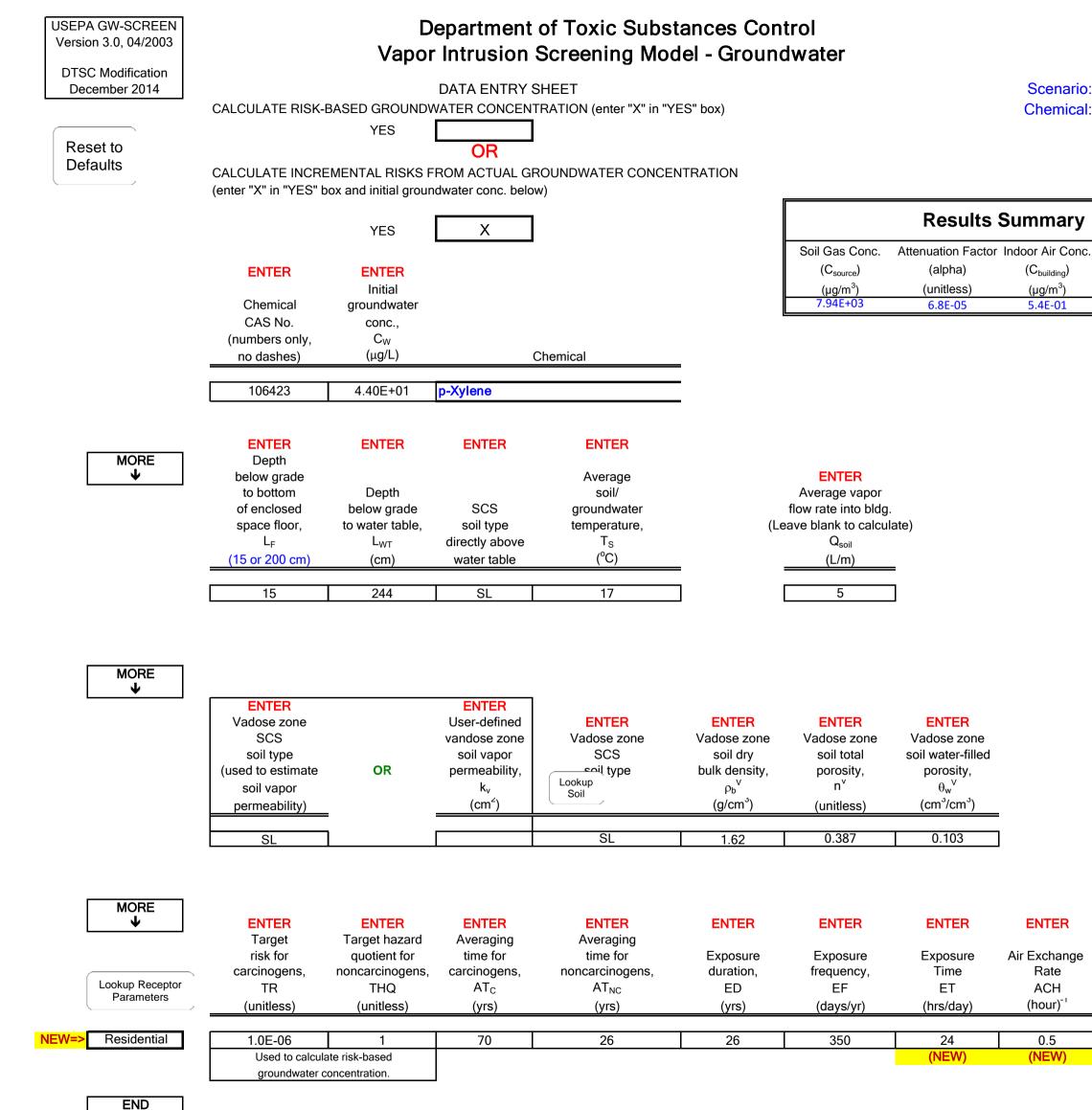
### Scenario: Residential Chemical: m-Xylene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
5.6E-01	NA	5.4E-03	NA	NA



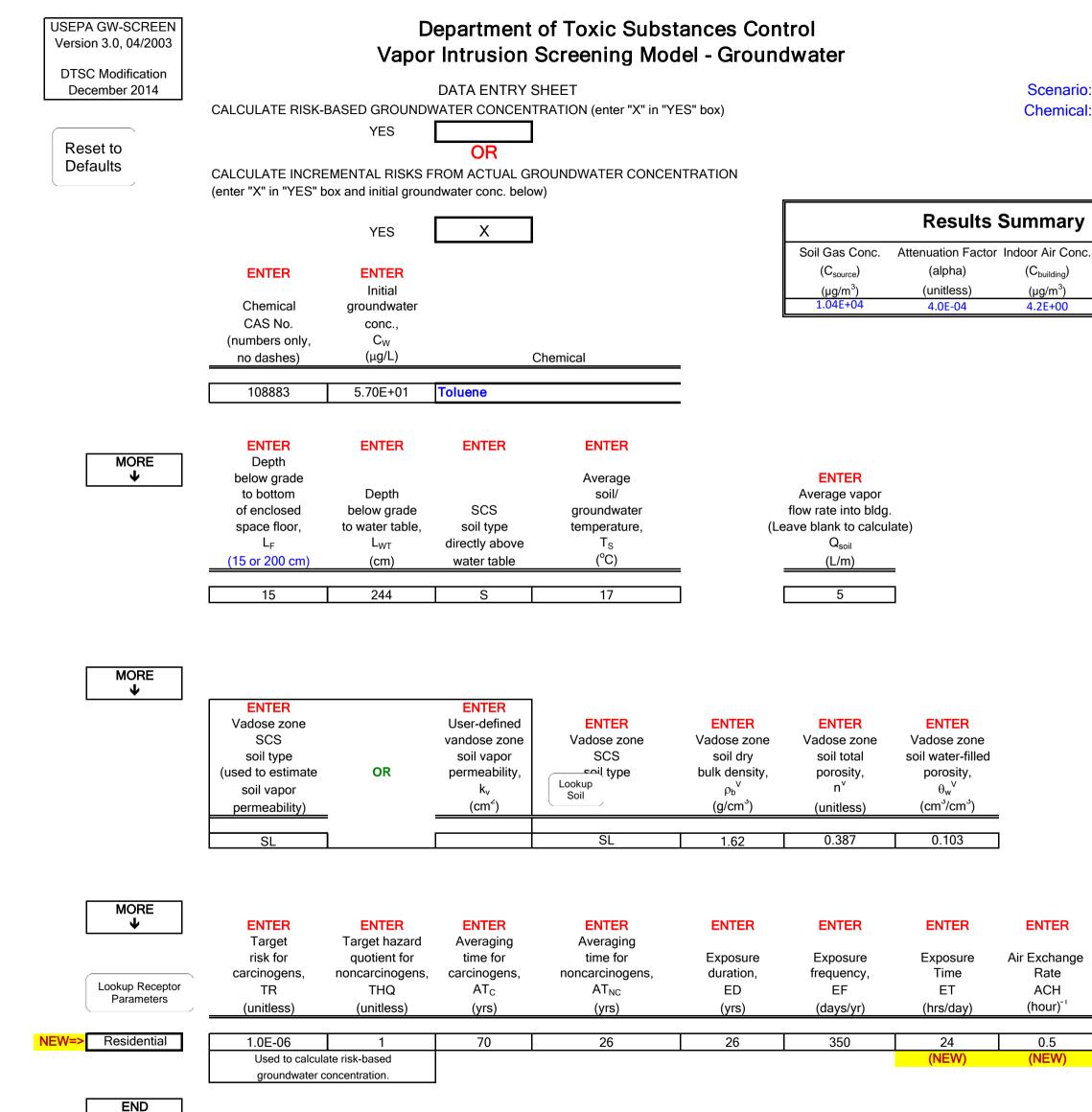
### Scenario: Residential Chemical: o-Xylene

mmary				Groundwater ntration
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
1.7E-01	NA	1.7E-03	NA	NA



### Scenario: Residential Chemical: p-Xylene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
5.4E-01	NA	5.2E-03	NA	NA

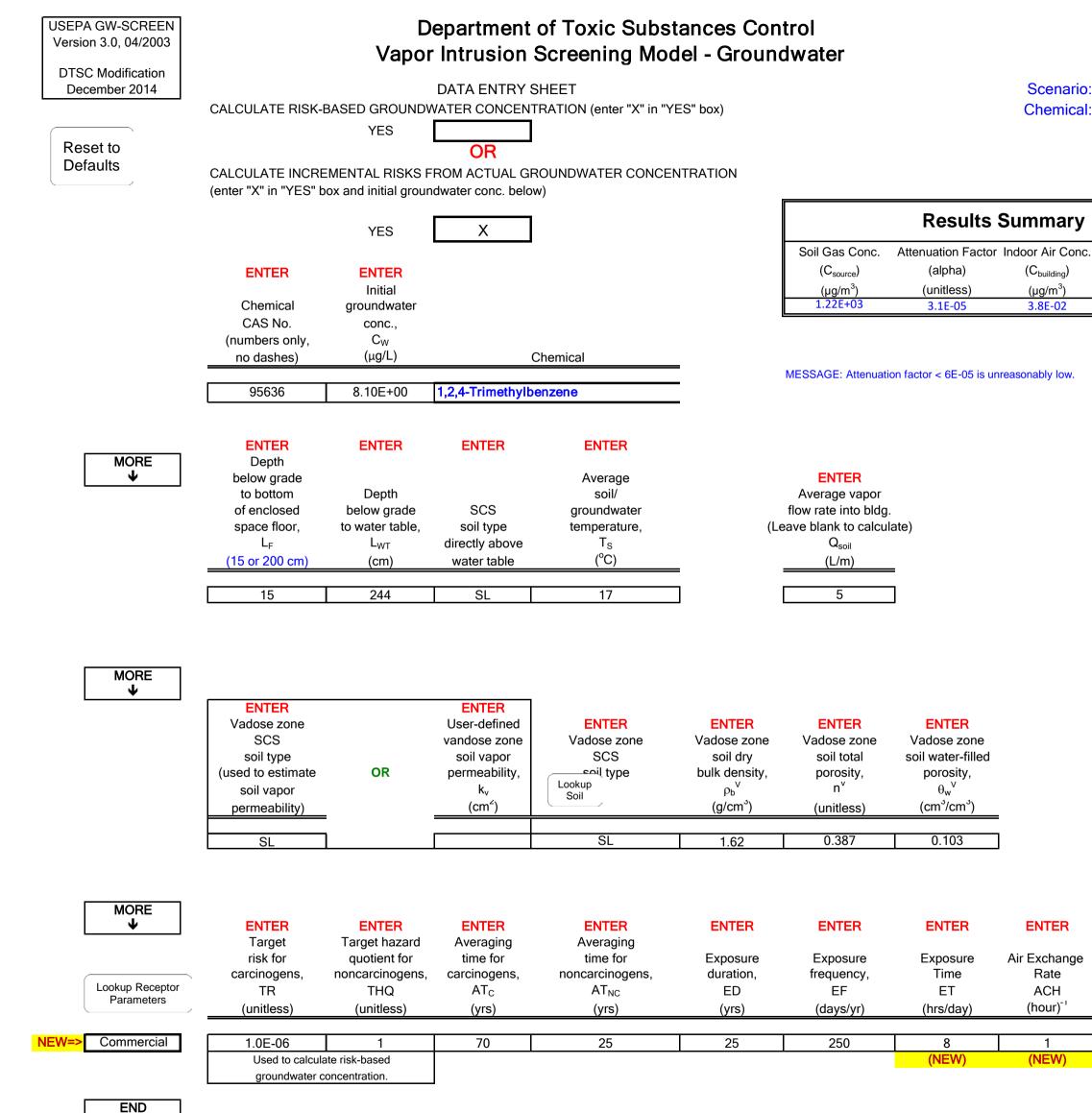


### Scenario: Residential Chemical: Toluene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
4.2E+00	NA	1.3E-02	NA	NA

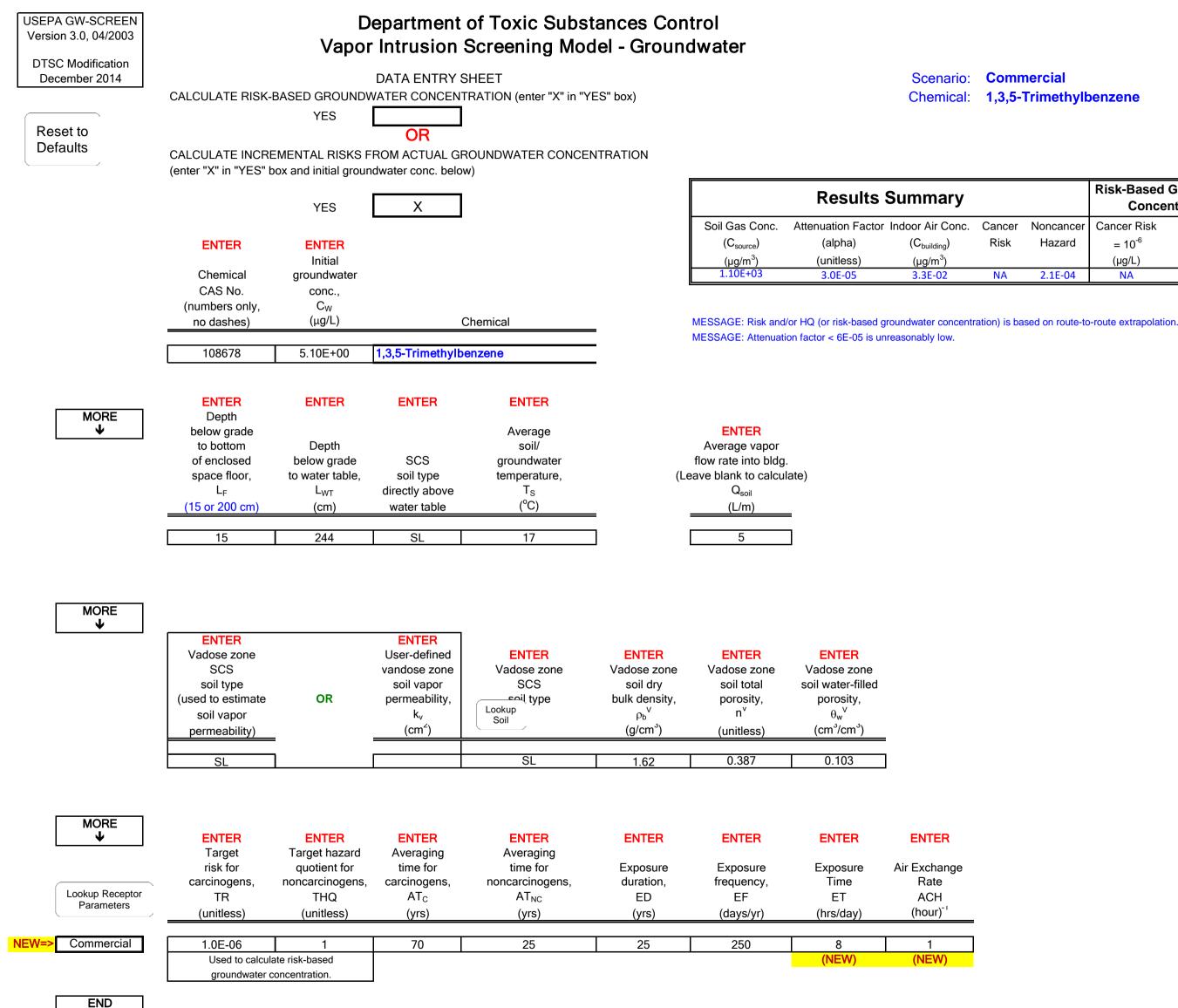
## **APPENDIX F**

## Johnson & Ettinger Model Results Commercial Scenario



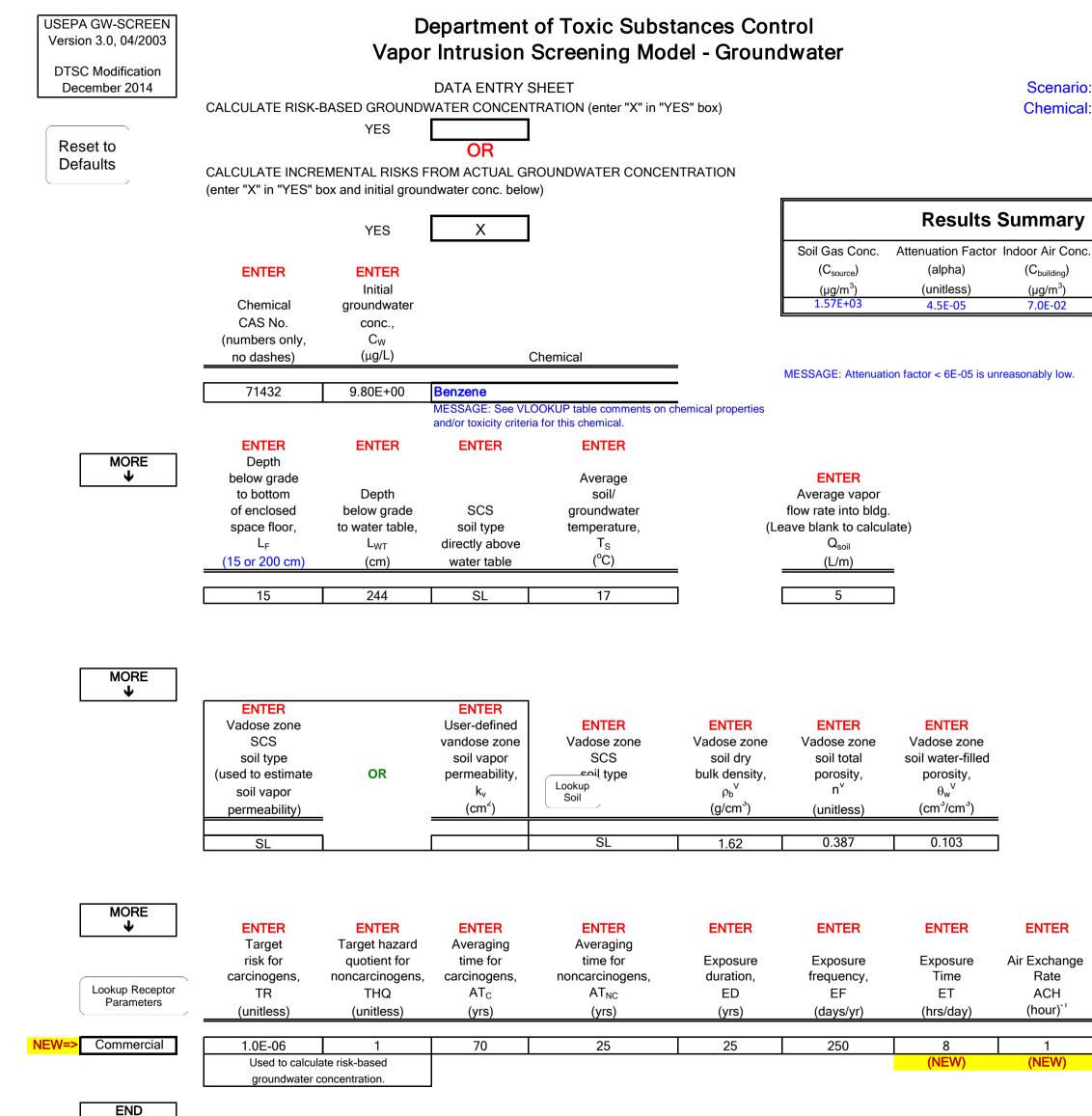
### Scenario: Commercial Chemical: 1,2,4-Trimethylbenzene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
3.8E-02	NA	1.2E-03	NA	NA



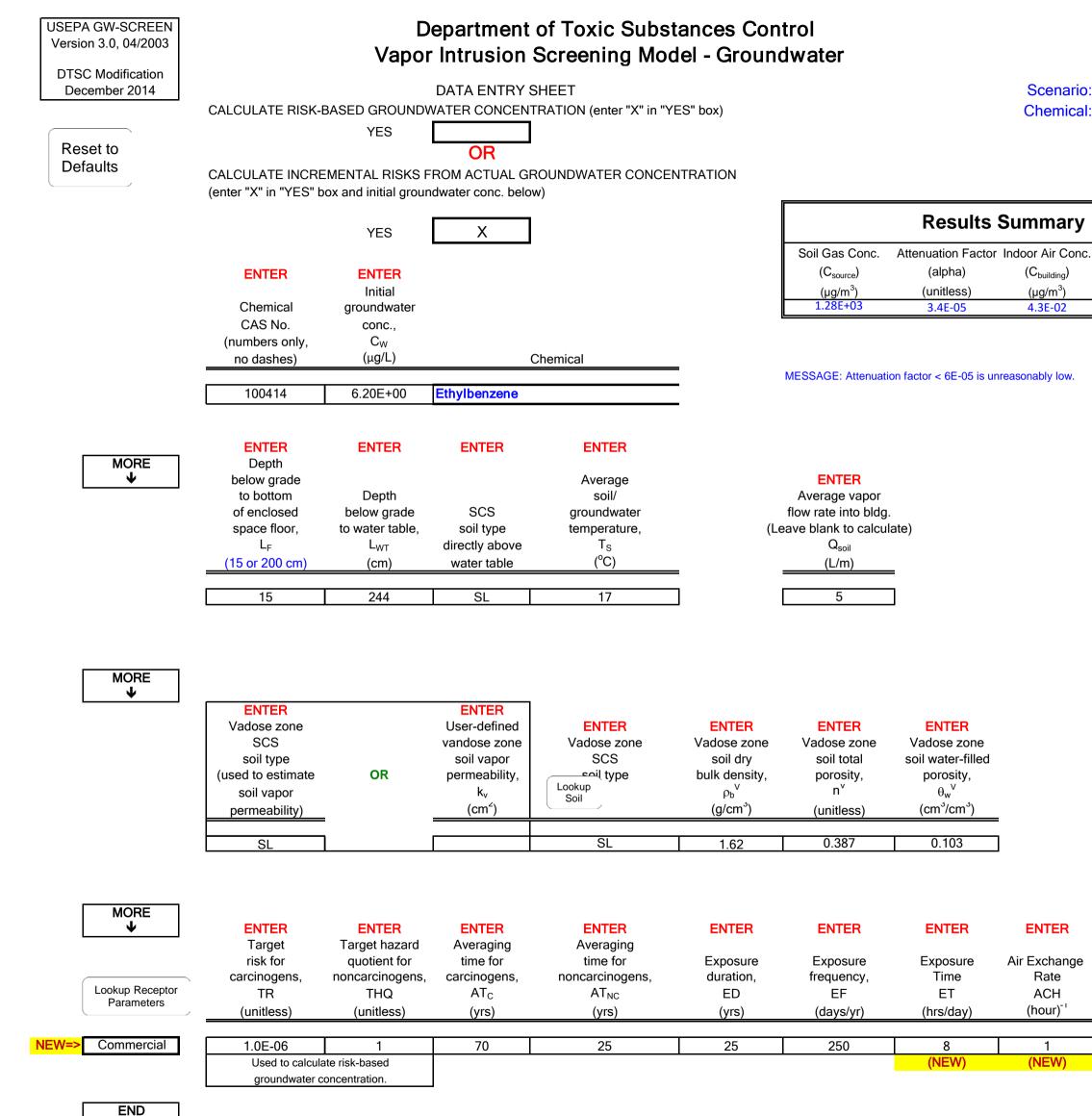
### Scenario: Commercial Chemical: 1,3,5-Trimethylbenzene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
3.3E-02	NA	2.1E-04	NA	NA



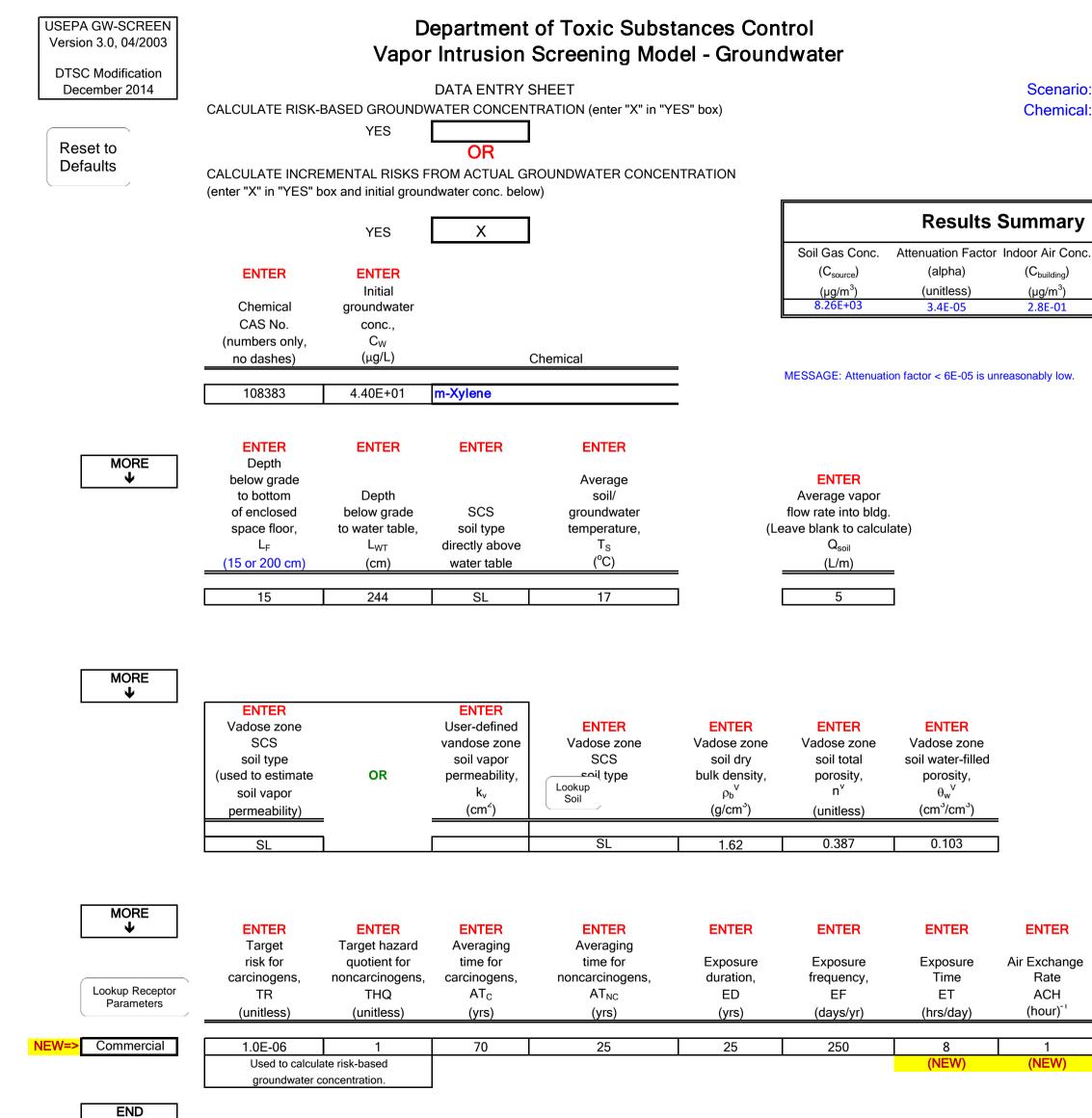
### Scenario: Commercial Chemical: Benzene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	= 10 <sup>-6</sup>	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
7.0E-02	1.7E-07	5.3E-03	NA	NA



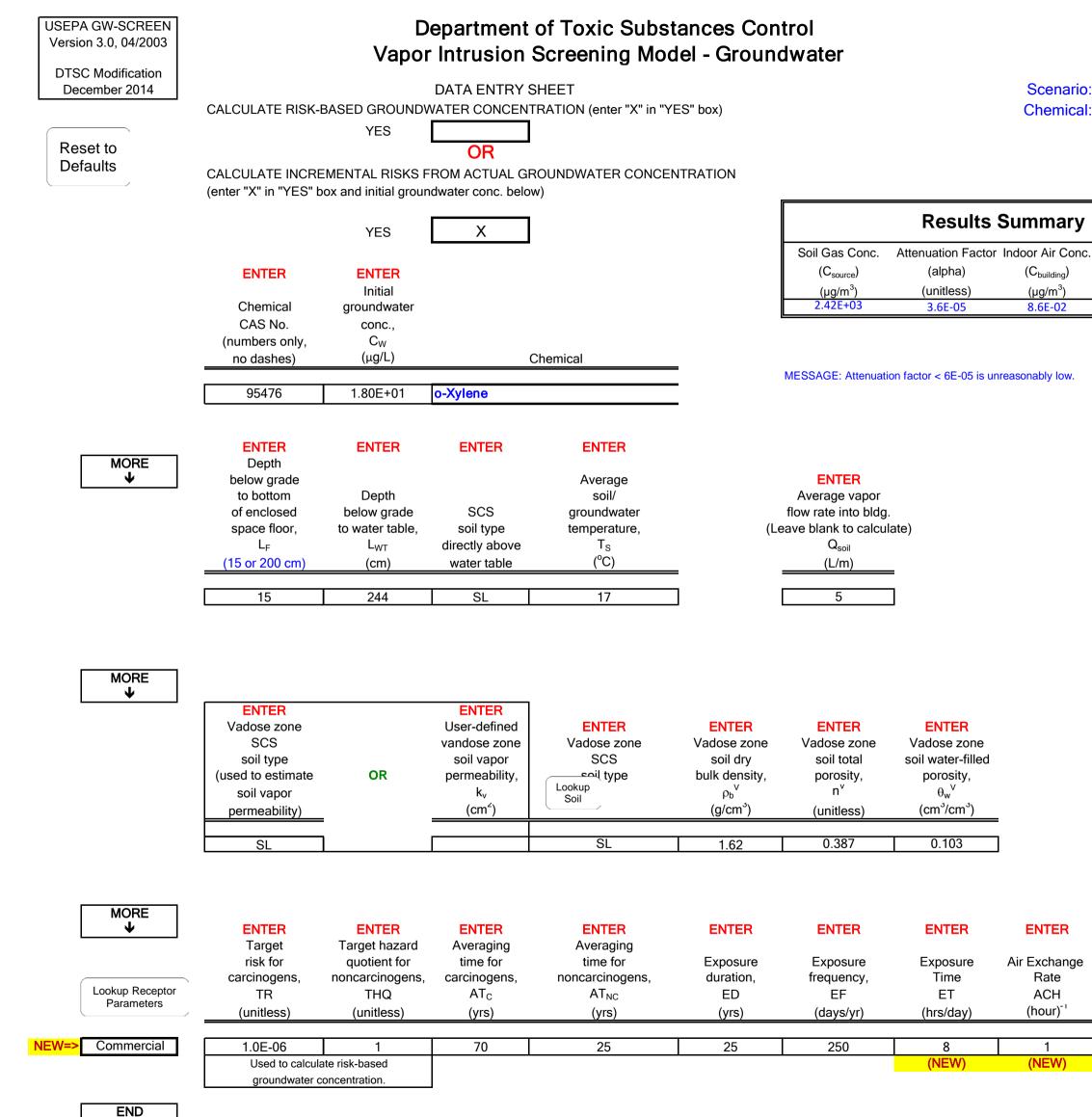
### Scenario: Commercial Chemical: Ethylbenzene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m³)			(µg/L)	(µg/L)
4.3E-02	8.8E-09	9.9E-06	NA	NA



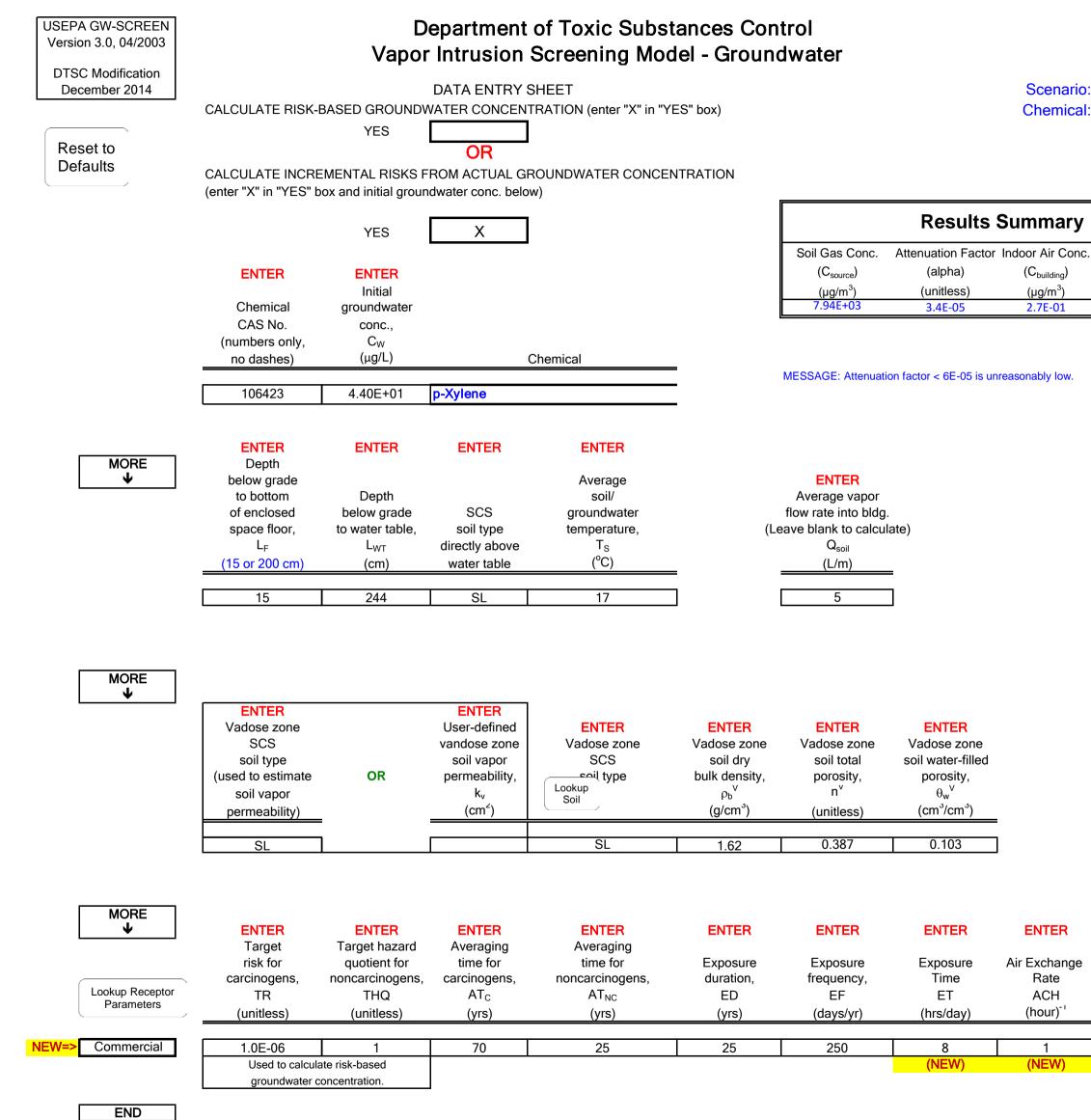
### Scenario: Commercial Chemical: m-Xylene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
2.8E-01	NA	6.4E-04	NA	NA



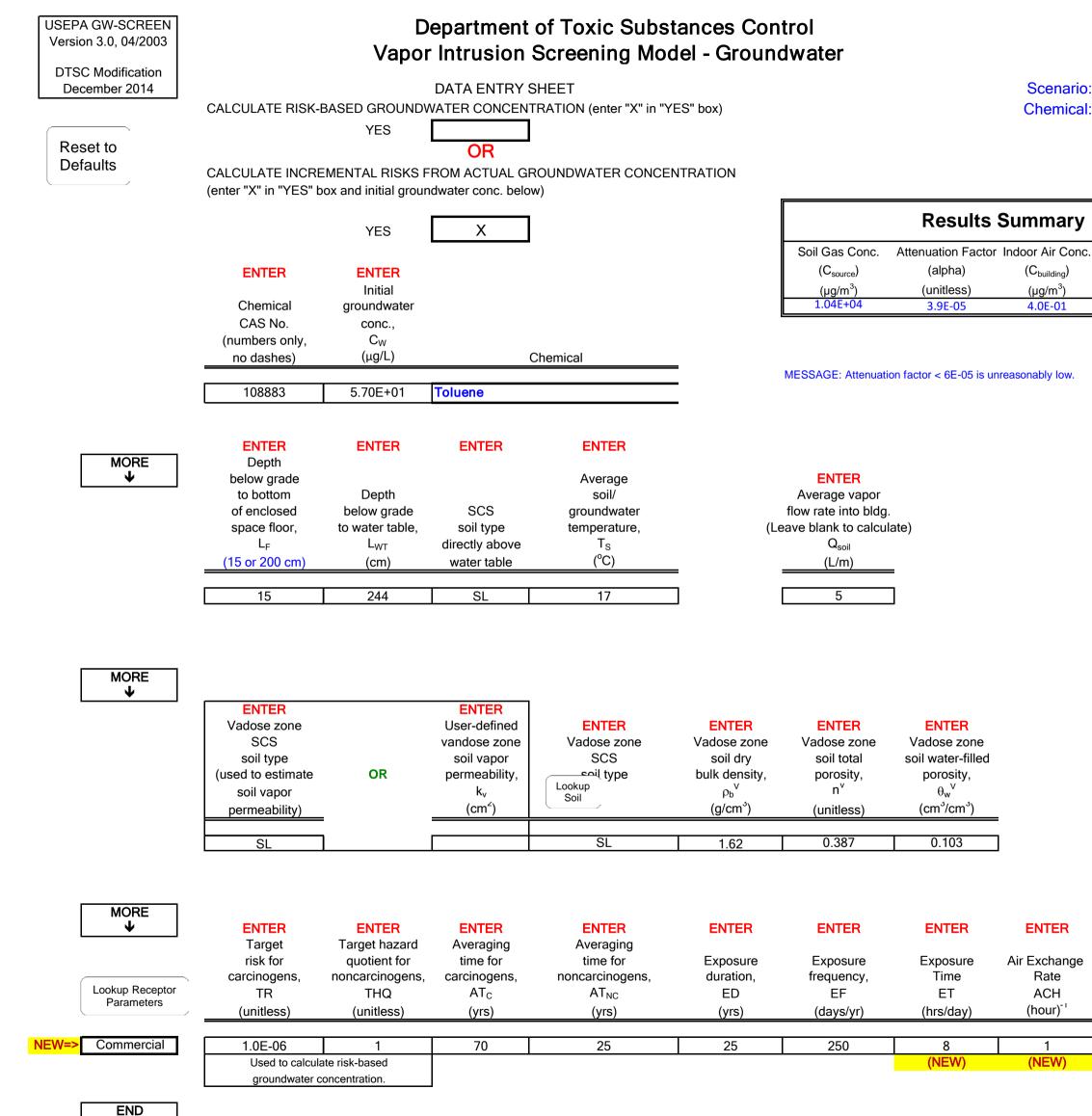
### Scenario: Commercial Chemical: o-Xylene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
8.6E-02	NA	2.0E-04	NA	NA



### Scenario: Commercial Chemical: p-Xylene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	$= 10^{-6}$	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
2.7E-01	NA	6.2E-04	NA	NA



### Scenario: Commercial Chemical: Toluene

mmary			Risk-Based Groundwater Concentration	
oor Air Conc.	Cancer	Noncancer	Cancer Risk	Noncancer
(C <sub>building</sub> )	Risk	Hazard	= 10 <sup>-6</sup>	HQ = 1
(µg/m <sup>3</sup> )			(µg/L)	(µg/L)
4.0E-01	NA	3.1E-04	NA	NA