APPENDIX A

Screening-level Risk Assessment

TABLE OF CONTENTS

A.1	Objective	2
A.2	Existing Site Conditions And Exposure Point Concentrations	2
A.3	Data Collection and COPC Identification	4
A.4	Exposure Pathway Assessment	6
A.5	Redevelopment Scenario	8
	A.5.1 Future On-site Industrial Worker	8
	A.5.2 Intake Assumptions	9
A.6	Toxicity Assessment	11
A.7	Risk Characterization	11
	References	13

Tables

Figures

This SRA for Parcel C of the former C-6 Facility was conducted in accordance with the RAWP (Ogden, 2000), as revised based on the April 12, 2001 comments provided by OEHHA. The RAWP and the response to OEHHA's comments (Haley & Aldrich, 2001) should be referred to for more detailed information regarding risk assessment procedures for the Former C-6 Facility. In general, the procedures referenced in the above-noted documents and followed herein conform to both USEPA and DTSC risk assessment guidance.

A.1 OBJECTIVE

The objective of the SRA was to provide a conservative indication of risk to human health from potential exposure to site-related COPCs in soil and groundwater beneath Parcel C (based on existing conditions after completion of site investigation, demolition, remedial excavation, remediation confirmation sampling, and grading activities). The remedial excavation activities were described previously, in Section 5. Ongoing deep soil and groundwater remediation activities are primarily being conducted to mitigate existing and possible future impacts to groundwater quality.

The SRA was intentionally designed to be conservative so that no further risk assessment or remedial action will be required to protect human health if the SRA results indicate that the COPCs do not pose a significant risk to human health (i.e., the calculated risks are less than OEHHA-approved target acceptable risk levels). These target risk levels are an excess lifetime cancer risk of $1x10^{-5}$ and a total hazard index for noncancer effects of 1.0.

A.2 EXISTING SITE CONDITIONS AND EXPOSURE POINT CONCENTRATIONS

As indicated above, this SRA provides an estimate of risk from potential exposure to current on-site conditions. A summary of the on-site conditions and of the determination of the chemical concentrations that people may be exposed to (exposure point concentrations) is presented below.

A.2.1 Existing Site Conditions

Facility structures in Parcel C have been demolished and the construction debris removed from the property. Parcel C has also undergone significant remedial excavation efforts followed by grading to accommodate redevelopment construction activities. The remedial excavation activities are described in Section 2.3.1. During grading, a minimum of the upper 5 feet to a maximum of the upper 22 feet of soil was over-excavated and recompacted. In addition, approximately 250,000 cubic yards of "clean" import soil was brought onto and distributed throughout Parcel C. Overexcavated and imported soil was compacted to final grade. This resulted in about half of the upper 12 feet of soil, i.e., shallow soil, consisting of "clean" import. The criteria for acceptance of import soil are described in Section 2.3.3. In brief, soil that was sampled and shown to be at or near southern California native background levels was accepted for import. The current ground surface elevation is between 3 feet lower and 5.5 feet higher than the pre-grading ground surface elevation. The soil sample depths reference back to the pre-grading ground surface elevations.

As indicated in Section 6, shallow groundwater beneath portions of Parcel C has been impacted by releases originating from former Parcel C operations. Two groundwater plumes have been identified. These are shown on Figures 30 through 32. The plume in proximity to former Buildings 1 and 36 has also impacted groundwater to the north of Parcel C. This off-site area to the north of Parcel C is herein referred to as the Parcel A remediation easement. No further action has been granted by the LARWQB for shallow soil within Parcel A. Shallow soil is defined as soil present from the ground surface to a depth of 12 feet bgs. Chemical concentrations measured in deep soil and groundwater samples within the Parcel A easement are also included in this SRA. Thus, conclusions presented in this SRA for Parcel C also pertain to the Parcel A remediation easement. Figure A-1, located at the end of this Appendix, illustrates the Parcel A remediation easement.

A.2.2 Exposure Point Concentrations

Exposure point concentrations (EPCs) are the media concentrations to which receptors may be exposed. The EPC concentrations for shallow soil were identified as the 95 percent upper confidence limit (95% UCL) of the arithmetic mean of each COPC, unless the maximum concentration was less than the 95% UCL. In that case, the maximum concentration for that COPC was used as the EPC for shallow soil. The 95% UCL concentrations were calculated based on the statistical distribution of the data. The 95% UCLs for a normal distribution and for a lognormal distribution were both calculated following USEPA 1992. As indicated in the RAWP, the distribution (normal versus lognormal) of the data set for each chemical was determined using D'Agostino's Test of Normality and a review of histograms. When neither the data set (untransformed) or the log-transformed data set for a particular chemical were identified as being normally distributed using the D'Agostino's Test of Normality, the histograms of the data set and the log-transformed data set were created. The distribution associated with the histogram most closely representing a uniform bell-shaped curve was selected. If neither histogram appeared to have a uniform bell-shape, the highest of the calculated 95% UCL for the data set and the log-transformed data set was selected as the 95% UCL.

The sample data collected from within the upper 12 feet and from deeper depths within the areas overexcavated were used to calculate the 95% UCL concentrations. The samples from the overexcavated areas were included since, based on the grading operations, these soils may currently be within the upper 12 feet of soil on Parcel C. The EPC calculations for shallow soil are presented in Appendix B.

Maximum soil gas, deep soil, and groundwater concentrations were used as EPCs for the estimation of risk associated with exposure to these media and depths.

The SRA is conservative in that it assumes COPC concentrations will remain constant for the duration of the exposure period and that all COPCs are co-located with regard to exposure. COPCs were actually detected over the property, but exposure to all COPCs during the entire exposure period are assumed. COPC concentrations are likely to decrease over time due to the following:

- No new contaminant mass associated with Former C-6 Facility operations will be released into the subsurface environment.

- The likelihood of contaminants migrating into Parcel C from releases associated with adjacent Former C-6 Facility property operations is relatively low as elevated soil impacts on Parcels A, B, and D have been remediated as requested by the LARWQCB. In addition, groundwater impacts associated with Former C-6 Facility operations originated from former operations on Parcel C, and chemical concentrations in impacted groundwater are decreasing with time and will be remediated as required. However, it should be noted that other properties in proximity to Parcel C have been impacted and are being investigated/remediated under the oversight of DTSC or USEPA. These properties are identified in Figure A-1, and include the ILM site, the Del Amo Superfund site, and the Montrose Chemical Superfund site.

- Chemical degradation on Parcel C has been ongoing in vadose zone soil and groundwater and it is reasonable to expect that the current relationship between released chemicals and their degradation byproducts conservatively represents future conditions. As such, the likelihood of as yet undetected degradation byproducts occurring in the future is low.

A.3 DATA COLLECTION AND COPC IDENTIFICATION

For human health risk assessment purposes, the vadose zone beneath Parcel C was divided into two layers: from the ground surface to 12 feet bgs and from 12 feet bgs to the maximum depth investigated. This division was based on 12 feet bgs being the maximum depth likely to be disturbed during redevelopment activities, and, thus, the maximum depth that future receptors may be exposed to soil.

Table A-1 presents the maximum concentrations of inorganic chemicals for these samples and the facility-specific background inorganic chemicals concentrations. The maximum concentration of each metal was compared to the corresponding facility-specific background concentration following the comparison test procedure described in the February 1997, DTSC document entitled *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, Final Policy (DTSC, 1997).* The derivation of the facility-specific background inorganic chemicals concentrations is described in a January 2002 technical memorandum (Haley &Aldrich, 2002). A review of Table A-1 shows the maximum on-site concentrations of numerous inorganic chemicals exceed the maximum facility-specific background concentrations. These inorganic chemicals include arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. In accordance with the above-referenced DTSC guidance, a second statistical test, the Wilcoxon Rank Sum Test, was used to further evaluate the site data for these inorganic chemicals. The results of the Wilcoxon Rank Sum Test, presented in Appendix B, indicate that barium, beryllium, chromium, cobalt, nickel, vanadium, and zinc concentrations in vadose soil beneath Parcel C are not significantly different than background levels, and therefore are not considered COPCs. However, concentrations of arsenic, cadmium, copper, lead, mercury, molybdenum, selenium, silver, and thallium appear to be significantly different from background levels. These inorganic chemicals are, thus, considered to be present at above background concentrations in vadose zone soil beneath Parcel C, and COPCs for Parcel C. Any concentration of hexavalent chromium and hydrogen cyanide

is considered to be above background concentrations. Hexavalent chromium and hydrogen cyanide were also detected in vadose zone soil beneath Parcel C, and are, thus, included as COPCs.

Table A-2 presents a summary of detected organic chemicals at Parcel C. As indicated in Table A-2, 37 VOCs, and 34 SVOCs, including PAHs and PCBs, were detected in soil matrix samples collected in Parcel C. The VOCs detected in the upper 12 feet of the soil column include acetone, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, carbon tetrachloride, chloroform, dichlorodifluoromethane, 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-dichloroethylene (cis-1,2-DCE), ethylbenzene, 2-ethyl-1-hexanol, isopropyl benzene, p-isopropyl toluene, methyl ethyl ketone (MEK, 2-butanone), 4-methyl-2-pentanone (MIBK), methyl tert-butyl ether (MTBE), methylene chloride, n-propylbenzene, 1,2,3,4-tetrachloroethane, PCE, tetrahydrofuran, toluene, 1,2,3-trichlorobenzene, 1,24-trichlorobenzene, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-TCA, TCE, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylenes. The VOCs detected at depths deeper than 12 feet bgs include benzene, trans-1,2-DCE, 2-hexanone, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, and those detected in the shallow soil with the exception of tert-butylbenzene, MTBE, 1,2,3,4-tetrachlorobutane, 1,2,3-trichlorobenzene, and 1,2,4-trichlorobenzene.

The SVOCs detected in the upper 12 feet of the soil column include acenaphthene, acenaphthylene, anthracene, Aroclor 1248, Aroclor 1254, Aroclor 1260, benzo(a)anthracene, benzo(a)pyrene, benzo(a)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, chrysene, 4,4-dichlorodiphenyltrichloroethane (4,4-DDT), 4,4-dichlorodiphenyldichloroethane (4,4-DDD), and 4,4-dichlorodiphenyldichloroethylene (4,4-DDE), dibenzo(a,h)anthracene, dibenzofuran, di-n-butyl phthalate, 1,4-dioxane, fluoranthene, fluorene, hexachlorobenzene, indeno(1,23-cd)pyrene, 2-methylnaphthalene, naphthalene, nitrobenzene, 1-nitro-1,1-dichloroethane, 1-ocylcyclohexane, phenanthrene, phenol, and pyrene. The SVOCs detected at depths deeper than 12 feet bgs include those detected in shallow soil with the exception of Aroclor 1254, carbazole, 4,4-DDT, 4,4-DDD, 4,4-DDE, dibenzofuran, hexachlorobenzene, nitrobenzene, and phenol. Ten VOCs were detected in soil gas. These VOCs include chloroform, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, PCE, toluene, 1,1,1-TCA, TCE, trichlorotrifluoromethane, and xylenes. It should be noted that the potential health risks associated with TPH are assessed according to their toxic components (e.g., PAHs and aromatic hydrocarbons such as benzene).

For the purposes of the SRA, inorganic chemicals present at concentrations greater than facility-specific background levels and all detected organic chemicals in shallow soil, and VOCs detected in soil gas or detected in soil or groundwater but not analyzed for in soil gas were considered to be COPCs. The COPCs identified for shallow soil and for soil gas are listed in Table A-3.

The chemical 1,2,3-trichloropropane was not considered a COPC, since only one sample out of 1,540 analyzed had a detected concentration of this chemical, and at an estimated value below the laboratory detection limit.

The VOCs identified with an asterisk on Table A-3 were added as COPCs in soil gas; because they were detected in soil or groundwater, but were not tested for in soil gas. The rationale for adding these chemicals as COPCs in soil gas is presented in Section A.4.3.

A.4 EXPOSURE PATHWAY ASSESSMENT

For an exposure pathway to be considered complete, it must have the following elements:

- A contaminant source
- A retention medium and transport mechanism
- A point of potential human contact with the contaminated medium
- An exposure route at the exposure point

Since only possible future receptors are evaluated in the SRA, pathways can only be considered potentially complete. Consequently, possible exposure pathways were evaluated to identify those that are potentially complete for a future receptor.

If any of the required elements are absent, the exposure pathway is considered incomplete (i.e., no exposure will occur) and further consideration of the associated health risks is not required. However, even if a pathway is considered potentially complete, it could be considered insignificant if (1) the associated risk is so small, relative to other pathways, that it will not add perceptibly to the total exposure being evaluated or (2) the potential risk contribution from an insignificant pathway would be trivial (USEPA, 1992). Insignificant pathways need not be quantitatively evaluated in the SRA.

Parcel C will be redeveloped for mixed-use commercial/industrial purposes. Property adjacent to Parcel is developed for commercial and industrial purposes. The closest residential properties are located approximately 1,200 feet north and 1,400 feet southwest of Parcel C. Possible receptors on adjacent properties were thus identified below as off-site occupational workers. An aerial photograph taken of the facility property prior to demolition and grading activities is presented as Figure A-1. The land use of and/or facility name for adjacent properties are labeled on this figure.

Five possible future human receptors for the commercial/industrial redevelopment scenario were identified. For the purposes of an SRA, a representative receptor was then developed from these receptors to represent the conglomerate of the possible receptors associated with the future commercial/industrial redevelopment scenario and their complete exposure pathways. This SRA was used to estimate health risk for the representative receptor of the commercial/industrial redevelopment scenario, herein referred to as the future on-site industrial worker. The future on-site industrial worker is described in Section A.5.

The relationship between the COPCs in impacted media and the five possible future receptors is identified in the CEM presented in Table A-4. From the CEM, the following possible future receptors and potentially complete exposure pathways were identified both during and after site redevelopment:

- On-site construction worker during site redevelopment
  - Incidental ingestion of soil

- Dermal contact with soil
- Inhalation of fugitive particulates
- Inhalation of organic vapors (i.e. VOCs) emanating into ambient air (insignificant)
- Dermal contact with storm water runoff (insignificant)

- Off-site occupational worker during site redevelopment
  - Inhalation of fugitive particulates
  - Inhalation of organic vapors emanating into ambient air (insignificant)
  - Inhalation of organic vapors in buildings

- On-site occupational worker after site redevelopment
  - Inhalation of fugitive particulates (insignificant)
  - Inhalation of organic vapors emanating into ambient air (insignificant)
  - Inhalation of organic vapors in buildings

- On-site gardener after site redevelopment
  - Incidental ingestion of soil
  - Dermal contact with soil
  - Inhalation of fugitive particulates
  - Inhalation of organic vapors emanating into ambient air (insignificant)
  - Dermal contact with storm water runoff (insignificant)

- Off-site occupational worker after site redevelopment
  - Inhalation of fugitive particulates (insignificant)
  - Inhalation of organic vapors emanating into ambient air (insignificant)
  - Inhalation of organic vapors in buildings

It should be noted that in the context of the subject SRA, the term "on-site" is applied to potential receptors located inside the boundary of Parcel C. Conversely, the term "off-site" is applied to potential receptors located outside of the boundary of Parcel C.

Based on the nature of the sediments that constitute the Bellflower aquitard and the sediments between the Bellflower aquitard and the deep regional aquifer system, it is unlikely that a complete pathway exists for the potential migration of chemical compounds detected in the Bellflower aquitard to an active production well screened within the deep aquifer system in the site vicinity. The LARWQCB concurs that water in the Bellflower aquitard is not suitable for water supply purposes and this potential pathway need not be included in the SRA (Personal communication with John Geroch, June 2001). Accordingly, exposure via the ingestion of impacted drinking water and the inhalation of VOCs from other potable water uses was not evaluated in the SRA for Parcel C. However, potential human exposure to impacted groundwater in the Bellflower aquitard is addressed in the SRA by evaluating the possible migration of organic vapors emanating from groundwater into surface structures.

A.5 REDEVELOPMENT SCENARIO

As noted above, for SRA purposes, similar to the premise for derivation of USEPA Region IX PRGs, a conservative representative receptor was identified for the commercial/industrial redevelopment scenario. The representative receptor serves as a surrogate to account for all five of the receptors identified for this redevelopment scenario. Specifically, it is assumed that a future on-site industrial worker provides a conservative representation of all of the potential receptors identified for the commercial/industrial redevelopment scenario. Thus, the future on-site industrial worker was identified as the representative receptor for the proposed site redevelopment.

This future on-site industrial worker is the same as the industrial receptor developed by USEPA Region IX during its derivation of PRGs, with the only difference being the future on-site industrial worker identified herein also potentially inhales organic vapors in buildings. The PRGs were developed by USEPA using conservative assumptions and are considered to be protective of human health, including the health of sensitive groups, over a lifetime. As indicated in Section A.5.2, PRGs have been used in the SRA to estimate risk from several of the exposure pathways that are relevant to the future on-site industrial worker.

The estimated risks for the future on-site industrial worker provides an "overestimate" of the risk for all five site-specific receptors identified in Section A.4. If the health risks associated with the commercial/industrial redevelopment scenario are less than acceptable target risk levels, then no further action is required prior to redeveloping the site for commercial/industrial purposes.

A summary of the characteristics of the future on-site industrial worker, and justification for how this receptor provides a conservative representation of the receptors within that scenario, is presented in the following sections.

A.5.1 Future On-site Industrial Worker

It is assumed that the future on-site industrial worker would be subject to the following complete exposure pathways over a 25-year period:

- Incidental ingestion of soil
- Dermal contact with soil
- Inhalation of fugitive dust
- Inhalation of organic vapors emanating into ambient air
- Inhalation of organic vapors in buildings

It should be noted that although inhalation of organic vapor emanating into ambient air is considered insignificant for one or more of the five possible future receptors, it is quantified within the SRA.

The future on-site industrial worker provides a conservative representation of each of the five possible receptors relevant to a commercial/industrial redevelopment scenario because, by assuming the future on-site industrial worker is a compilation of the five possible receptors, it is assumed that:

- Inhalation of organic vapors in buildings is a complete exposure pathway, rather than an incomplete exposure pathway as indicated in the CEM, for the on-site construction worker and the on-site gardener.

- The on-site construction worker will be exposed for 25 years, as opposed to an assumed 6 months.

- The on-site occupational worker after site redevelopment has fewer complete exposure pathways than the future on-site industrial worker.

- The future on-site worker will be exposed to fugitive dust for 25 years as opposed to an assumed 6 months for the off-site occupational worker.

- The off-site occupational worker during site redevelopment has fewer complete exposure pathways than the future on-site industrial worker.

- The off-site occupational worker after site redevelopment has fewer complete exposure pathways than the future on-site industrial worker.

The risk calculations for each of the exposure pathways, including inhalation of vapors in a building and exposures to lead, are presented in Appendix B.

A.5.2 Intake Assumptions

In accordance with the RAWP (Ogden, 2000), and as approved by OEHHA in its April 12, 2001 comments on the RAWP:

- Health risk for the future on-site industrial worker due to ingestion of soil, inhalation of particulates, inhalation of organic vapors emanating into ambient air and dermal contact was estimated using the industrial soil PRGs developed by USEPA Region IX (USEPA, 2000) adjusted for California toxicity criteria.

- Health risk for the future on-site industrial worker due to inhalation of organic vapors in both an on-site, on-grade structure was estimated using the County of San Diego vapor pathway model for a commercial building (County of San Diego, 2000). A Level 2 evaluation was used to include site-specific soil parameters, and scenario-specific exposure time, exposure frequency, and air exchange rate. The exposure parameters for this pathway are those identified in the RAWP.

Health risk from exposure to lead for the future on-site industrial worker due to ingestion of soil, inhalation of particulates, dermal contact, ingestion of drinking water, and ingestion of home grown produce was estimated using Version 7 of the DTSC Lead Risk Assessment Spreadsheet (LEADSPREAD) Model.

USEPA Region IX developed PRGs for exposures to soil, groundwater, and surface water to assess whether further evaluation of potential risks that may be posed by site-related chemicals is

appropriate. Industrial soil PRGs assume complete exposure pathways for ingestion of soil, inhalation of particulates, inhalation of organic vapors emanating into ambient air, and dermal contact. EPC concentrations for the 0- to 12-foot soil depth were used to estimate excess risk using the PRG exposure assumptions. As indicated previously, 12 feet bgs was considered to be the maximum depth likely to be disturbed during and after demolition and redevelopment activities, and, thus, the maximum depth that future receptors may be exposed to soil.

The County of San Diego vapor pathway model is a conservative, one-dimensional vapor migration model. Maximum soil gas concentrations were used to estimate risk using this vapor model for a future on-site industrial worker. To account for vapor migration from both soil and groundwater, actual on-site soil gas data, collected at approximately 12 feet bgs, were used for vapor transport modeling. Soil gas samples were co-located with soil samples collected at and in proximity to identified vadose zone source areas. Thus, they are representative of volatilization from impacted soil. Soil gas samples were also generally widely distributed throughout Parcel C. Thus, they would detect VOCs diffusing upwards from any potential zones of high VOC concentrations in the underlying groundwater. Therefore, the maximum measured soil gas sample concentrations are assumed to represent the maximum vapor concentrations likely to result from volatilization from both soil and groundwater.

Soil and/or groundwater samples may contain concentrations of VOCs that were not tested for in soil gas. To conservatively account for vapor concentrations of VOCs not tested in soil gas, but detected in soil and/or groundwater, soil gas concentrations for these VOCs can be estimated from the soil and groundwater data. Impacted soil samples were typically collected in areas where there are only soil impacts or where there are both soil and groundwater impacts. A portion of the chemical concentration reported in soil is present in the form of soil gas. This soil gas may be present as a result of vapor partitioning within impacted soil or from migration of vapors from impacted groundwater. In these cases, soil gas concentrations may be estimated from soil sample data. However, groundwater samples may have been collected in areas where only groundwater impacts exist and no soil samples were collected. Thus, the maximum of the estimated soil gas concentration derived from soil sample data and derived from groundwater sample data provides a conservative soil gas concentration for an area that either has only soil impacts, both soil and groundwater impacts, or only groundwater impacts.

For the purposes of the SRA, it is assumed that if VOCs detected in soil or in groundwater were not tested for in soil gas, those VOCs were added as COPCs in soil gas. For each of these additional COPCs, the maximum of the indoor air inhalation risk estimated using the soil data and using the groundwater data, was identified as the indoor air inhalation risk associated with that chemical. For each of the additional COPCs detected in soil, either the maximum soil concentration at any depth, or the maximum concentrations at each specified sampling depth, were used in the vapor model. When the maximum soil concentration at any depth was used, the depth of this concentration was assumed to have been measured directly beneath the foundation of a commercial building (i.e., a depth of 0.5 feet beneath an on-grade structure). For each of the additional COPCs detected in groundwater, the maximum groundwater concentration and a depth to groundwater of 65 feet bgs were assumed in the vapor model. As described in Section A.2, the use of measured maximum COPC concentrations provides conservative estimates of future human health risk. The following VOCs were detected in soil, but not tested for in soil gas, and were thus added to the COPC list for soil gas: acetone, MEK, n-butylbenzene, sec-

butylbenzene, tert-butylbenzene, carbon tetrachloride, 2-ethyl-1-hexanol, isopropyl benzene, p-isopropyltoluene, MTBE, n-propylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3,4-tetrachlorobutane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,4- trimethylbenzene, and 1,3,5-trimethylbenzene. The following VOCs were detected in groundwater, but not tested for in soil gas, and were thus added to the COPC list for soil gas: acetone, MEK, n-butylbenzene, carbon disulfide, carbon tetrachloride, 2-hexanone, styrene, 1,1,2,2-tetrachloroethane.

A.6 TOXICITY ASSESSMENT

California toxicity criteria, where available, were used to estimate excess lifetime cancer risks for carcinogens and hazard indices for noncarcinogenic effects. In order of priority, the following sources were used to compile the toxicity criteria:

1. Cal-EPA, OEHHA, Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp

2. Cal-EPA, OEHHA, Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, January 22, 2001, http://www.oehha.org/air /chronic_rels/AllChrels.htm

3. Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, September 13, 2001, http://www.arb.ca.gov /ab2588/riskassess.htm

4. USEPA Region IX PRGs, November 1, 2000, http://www.epa.gov/region09/waste/sfund/prg/

The toxicity criteria for the COPCs and the calculation of the adjusted PRGs are presented in Appendix B.

A.7 RISK CHARACTERIZATION

The calculations of excess lifetime cancer risk and hazard indices for the commercial/industrial redevelopment scenario are presented in Appendix B. As noted previously, inorganic chemicals present at concentrations greater than facility-specific background levels and all detected organic chemicals in shallow soil, and VOCs detected in soil gas or detected in soil or groundwater but not analyzed for in soil gas were considered to be COPCs. The risk estimates for the individual COPCs were summed to estimate the total excess lifetime cancer risk and the hazard indices for the individual COPCs were summed to estimate noncancer health effects. Typically, hazard indices are only summed for chemicals that have similar noncancer toxicological endpoints, by target organ or critical effect. Thus, summing the hazard indices for all of the COPCs in Parcel C, irrespective of their individual toxicological endpoints, is conservative in that it assumes that exposure to each COPC produces the same adverse health effect.

A summary of the estimated excess lifetime cancer risk and hazard indices for the commercial/industrial redevelopment scenario is presented in Table A-5. In brief, the results of the SRA indicate the estimated excess lifetime cancer risk associated with potential exposure to site-related chemicals beneath Parcel C is 4.6×10^{-6}, which is approximately 50 percent of the acceptable 1×10^{-5} target risk level. The estimated total hazard index for noncarcinogenic effects

is 0.90, which is 90 percent of the acceptable target hazard index of 1.0. The 99th percentile blood lead concentration predicted by the DTSC LEADSPREAD model (see Appendix B) for the occupational worker (future on-site industrial worker) is 3.3 micrograms per deciliter (µg/dL), which is three times less than the acceptable blood lead level of 10 µg/dL.

Maximum measured and estimated soil gas concentrations were compared to 20 percent of the corresponding LELs in Table A-6 to assess the potential for fire or explosion hazards related to elevated soil pore gas concentrations. As shown in Table A-6, the maximum soil gas concentration of each VOC detected in Parcel C is less than 20 percent of the corresponding LEL, with the exception of MEK and MIBK. The following samples have estimated pore space concentrations of MEK and/or MIBK that exceed 20 percent of the corresponding LEL: PD-27 (MEK of 8,700,000 ug/kg at 60 feet bgs, MIBK of 1,300,000 ug/kg at 60 feet bgs, MIBK of 650,000 ug/kg at 50 feet bgs) and 2BB-36-13 (MEK of 1,700,000 ug/kg at 29 feet bgs). Each of these samples (identified in Figure A-2) was collected from the Building 1 area undergoing remediation by soil vapor extraction. Therefore, these concentrations will decrease by running the existing remediation system. In the other areas sampled, there is no identified potential for fire or explosive conditions in subsurface structures (e.g., utility vaults, tunnels, etc.).

It should be noted that the assessment of risk for the future on-site industrial worker is protective for all of the site-specific receptors identified in the CEM (Table A-4). The future on-site industrial worker provides a conservative representation of all of the site-specific receptors identified in the commercial/industrial redevelopment scenario described in Section A.3. Based on the investigation data obtained to date and the assumptions presented in this SRA, no further human health risk assessment or remedial action to protect human health is required for Parcel C. Thus, based on the results of this SRA, Parcel C can be redeveloped for unrestricted commercial/industrial use. Should additional chemical data become available during the course of building demolition, site excavation or construction, it will be addressed using the same risk assessment process, and any unacceptable risks identified and mitigated.

References

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), 1997. *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, Final Policy*. February.

County of San Diego, Department of Environmental Health, 2000. *Users Guide to Vapor Risk 2000* (Model dated November 1999).

Haley & Aldrich, Inc. (Haley & Aldrich), 2001. *Technical Memorandum, Risk Assessment Work Plan Addendum No. 1, Boeing Realty Corporation, Former C-6 Facility, Los Angeles, California.* 11 July.

Haley & Aldrich, Inc. (Haley & Aldrich), 2002. *Technical Memorandum, Site-specific Background Metals Concentrations, Parcel C, Boeing Realty Corporation, Former C-6 Facility, Los Angeles,* 4 January.

Ogden Environmental and Energy Services Co., Inc. (Ogden), 2000. *Risk Assessment Work Plan, Boeing Realty Corporation, Former C-6 Facility, Los Angeles, California.* 29 November.

U.S. Environmental Protection Agency (USEPA), 1992. *Supplemental Guidance to RAGs: Calculating the Concentration Term.* Office of Emergency and Remedial Response. May.

U.S. Environmental Protection Agency (USEPA), 2000. *Region IX Preliminary Remediation Goals (PRGs).* November.

TABLE A-1

SUMMARY OF INORGANIC CHEMICALS AND COMPARISON TO SITE-SPECIFIC BACKGROUND METALS CONCENTRATIONS
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Metals	Concentrations (mg/kg)			Exceed Background Using Comparison Test? (Y or N)	Exceed Background Using Wilcoxon Rank Sum Test? (Y or N)	Selected as COPC (Y or N)	Exposure Point Concentration (Lessor of 95% UCL and Maximum Concentration) (mg/kg)
	Site-specific Background Concentrations BRC Former C-6 Facility, Parcel C	Maximum Parcel C Metals Concentrations (0 to 12-foot depth)	Maximum Parcel C Metals Concentrations (greater than 12-foot depth)				
Aluminum (Al)	43,300	43,300	35,800	N		N	
Antimony (Sb)	3.1	2.6	3.1	N		N	
Arsenic (As)	8.0	**23.5**	**307**	Y	Y	Y	3.3
Barium (Ba)	294	**485**	**570**	Y	N	N	
Beryllium (Be)	0.56	**1.8**	**1.1**	Y	N	N	
Cadmium (Cd)	1.0	**52.9**	**1.8**	Y	Y	Y	0.34
Chromium (Cr) - total	48.5	**510**	**664**	Y	N	N	
Chromium (Cr) - hexavalent	NA	**2.5**	**491**	NA		Y	0.31
Cobalt (Co)	20.0	**124**	**50**	Y	N	N	
Copper (Cu)	49.0	**1,100**	**92.5**	Y	Y	Y	24
Hydrogen cyanide	NA	**0.22**	NA	NA		Y	0.22
Lead (Pb)	7.2	**1,020**	**31.3**	Y	Y	Y	9.8
Mercury (Hg)	0.48	**0.6**	0.24	Y	Y	Y	0.05
Molybdenum (Mo)	2.7	**12**	**4.0**	Y	Y	Y	1.0
Nickel (Ni)	37.4	**132**	**41**	Y	N	N	
Selenium (Se)	1.8	**14**	0.83	Y	Y	Y	0.66
Silver (Ag)	1.6	**4.2**	**6.1**	Y	Y	Y	0.47
Thallium (Tl)	2.4	**3.0**	**3.3**	Y	Y	Y	1.5
Vanadium (V)	93.0	**148**	93	Y	N	N	
Zinc (Zn)	114	**325**	**140**	Y	N	N	

NA = Not applicable
Concentrations greater than maximum site-specific background concentration shown in bold.
Note: Background values are exceeded for the Wilcoxon Rank Sum Test if at p=0.05 (the 5% significance level), Z_{1-a} is equal or greater than 1.645.
* Maximum sample quantitation limit (SQL) presented when all results reported as nondetect

TABLE A-2

SUMMARY OF ORGANIC CHEMICALS CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

Organic Chemicals	Concentrations in Soil (ug/kg)		Concentrations in Groundwater (ug/l)**	Concentrations in Soil Gas (ug/l or mg/m^3)
	Lesser of 95% UCL and Maximum Concentration (0 to 12-foot depth)	**Maximum Concentration** (greater than 12-foot depth)	**Maximum Concentration**	**Maximum Concentration** (12-foot depth)
Acenaphthene	150	5,800		NV
Acenaphthylene	150	9,600		NV
Acetone	24	2,800	6.5	NA
Anthracene	120	2,000		NV
Aroclor 1248	19	50		NV
Aroclor 1254	21	<33*		NV
Aroclor 1260	59	290		NV
Benzene	<250*	1,200		<40*
Benzo(a)anthracene	110	1,100		NV
Benzo(b)fluoranthene	280	2,100		NV
Benzo(k)fluoranthene	270	750		NV
Benzo(ghi)perylene	210	910		NV
Benzo(a)pyrene	260	570		NV
bis(2-Ethylhexyl) phthalate	140	300		NV
n-Butylbenzene	8.2	2,100		NA
sec-Butylbenzene	5.4	1,000		NA
tert-Butylbenzene	3.8	<120,000*		NA
Carbon tetrachloride	1.8	11		<40*
Carbazole	430	<3,300*		NV
Chloroform	3.6	400		3
Chrysene	120	65,000		NV
4,4-DDD	6.1	<2*		NV
4,4-DDE	9.5	<5*		NV
4,4-DDT	4.4	<2*		NV
Dibenzo(a,h)anthracene	96	1,300		NV
Dibenzofuran	140	<3,300*		NV
Dichlorodifluoromethane	3.3	4.2		<40*
1,1-Dichloroethane	3.6	6,300		6
1,2-Dichloroethane	3.5	150		<40*
1,1-Dichloroethylene	4.6	5,400		79
cis-1,2-Dichloroethylene	3.8	1,600		8
trans-1,2-Dichloroethylene	<250*	19		<40*
Diethyl phthalate	<3,300*	180		NV
Di-n-butyl phthalate	190	330		NV
1,4-Dioxane	14	14		NV

TABLE A-2

SUMMARY OF ORGANIC CHEMICALS CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

Organic Chemicals	Concentrations in Soil (ug/kg)		Concentrations in Groundwater (ug/l)**	Concentrations in Soil Gas (ug/l or mg/m^3)
	Lesser of 95% UCL and Maximum Concentration (0 to 12-foot depth)	Maximum Concentration (greater than 12-foot depth)	Maximum Concentration	Maximum Concentration (12-foot depth)
Ethylbenzene	29	370,000		<40*
2-Ethyl-1-hexanol	1,400	NA		NA
Fluoranthene	160	29,000		NV
Fluorene	120	14,000		NV
Hexachlorobenzene	120	<3,300*		NV
2-Hexanone	<1,200*	14		NA
Indeno(1,2,3-cd)pyrene	190	830		NV
Isopropyl benzene	7.1	530		NA
p-Isopropyltoluene	6.4	1,800		NA
Methylene chloride	4.4	20,000,000		<40*
Methyl Ethyl Ketone (2-Butanone)	28	8,700,000	18,000	NA
4-Methyl-2-pentanone	22	1,300,000	3,100	NA
Methyl tert-butyl ether	3.9	<10*		NA
2-Methylnaphthalene	170	15,000		NV
Naphthalene	210	5,600		NV
Nitrobenzene	140	<3,300*		NV
1-Nitro-1,1-dichloroethane	270	NA		NV
1-Octylcyclohexane	NA	11		NA
Phenanthrene	210	59,000		NV
Phenol	140	<3,300*		NV
n-Propylbenzene	4.7	1,300		NA
Pyrene	140	11,000		NV
Styrene	<500*	<250,000*	0.64	NA
1,2,3,4-Tetrachlorobutane	560	NA		NA
1,1,2,2-Tetrachloroethane	<250*	240		<40*
Tetrachloroethene	4.0	140,000		25
Tetrahydrofuran	17	13		NV
Toluene	5.9	3,700,000		7
1,2,3-Trichlorobenzene	3.8	<120,000*		NA
1,2,4-Trichlorobenzene	4.0	<120,000*		NA
1,1,1-Trichloroethane	6.6	59,000,000		6
1,1,2-Trichloroethane	3.5	4,000		<40*
Trichloroethene	9.8	340,000		275
1,2,3-Trichloropropane	<250*	330		NA
Trichlorotrifluoromethane	<250*	<100,000*		4
1,1,2-Trichlorotrifluoroethane	<5*	<10*		<40*

TABLE A-2

SUMMARY OF ORGANIC CHEMICALS CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

Organic Chemicals	Concentrations in Soil (ug/kg)		Concentrations in Groundwater (ug/l)**	Concentrations in Soil Gas (ug/l or mg/m^3)
	Lesser of 95% UCL and Maximum Concentration (0 to 12-foot depth)	**Maximum Concentration** (greater than 12-foot depth)	**Maximum Concentration**	**Maximum Concentration** (12-foot depth)
1,2,4-Trimethylbenzene	16	6,700	0.47	NA
1,3,5-Trimethylbenzene	6.6	2,300	0.34	NA
Vinyl chloride	<500*	<250,000*		<40*
Xylenes	260	29,000,000		13

* Maximum sample quantitation limit (SQL) presented when all results reported as nondetect

** Groundwater concentrations listed for only those chemicals that were detected in groundwater and not tested for in soil gas

NA = Not analyzed

NV = Not considered volatile for purposes of evaluating VOC vapor migration

Notes:

Tetrahydrofuran is not identified as a VOC in the USEPA Region 9 PRG documentation, and is, thus, not included in the calculation of risk due to inhalation of indoor air.

Estimated excess lifetime cancer risk and estimated hazard quotient for 1,2,3-Trichloropropane not included in the total excess lifetime risk and total estimated hazard quotient, since it was detected in only 1 of 1,540 samples analyzed in Parcel C

Concentrations for samples with duplicate sample results or with more than one result due to analysis using multiple methods were chosen as follows:

1. Two non-detect results, lowest non-detect concentration selected.
2. One detect and one non-detect, detected concentration selected.
3. Two detected values, maximum detected concentration selected.

The USEPA Method 8310 results of 10,000 ug/kg for dibenzo(a, h)anthracene and 5,000 ug/kg for benzo(b)fluoranthene (Sample C-2-320-5) were not included in the SRA calculations; since, the more definitive EPA Method (GC/MS as opposed to HPLC) reported both sample results as less than 3,300 ug/kg.

Groundwater concentrations were selected from the annual January/February 2001 groundwater monitoring event, with the exception of the wells located in the Building 2 area. Groundwater concentrations from the wells located in the Building 2 area were selected from the July 2001 groundwater monitoring event, which displayed more conservative, higher concentrations that are more reflective of the historical trend for the area.

BOE-C6-0001418

TABLE A-3

COPCs IN SHALLOW SOIL AND SOIL GAS
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

COPCs in Shallow Soil		COPCs in Soil Gas
Acenaphthene	Hydrogen cyanide	Chloroform
Acenaphthylene	Indeno(1,2,3-cd)perylene	1,1-DCA
Acetone	Isopropylbenzene	1,1-DCE
Anthracene	p-Isopropyltoluene	Cis-1,2-DCE
Aroclor 1248	Lead	PCE
Aroclor 1254	Mercury	Toluene
Aroclor 1260	Methylene chloride	1,1,1-TCA
Arsenic	MEK	TCE
Benzo(a)anthracene	MIBK	Trichlorotrifluoromethane
Benzo(b)fluoranthene	2-Methylnaphthalene	Xylenes
Benzo(k)fluoranthene	Molybdenum	Acetone*
Benzo(g,h,i)perylene	Naphthalene	n-Butylbenzene*
Benzo(a)pyrene	Nitrobenzene	sec-Butylbenzene*
Bis(2-ethylhexyl)phthalate	1-Nitro-1,1-dichloroethane	tert-Butylbenzene*
n-Butylbenzene	1-Ocylcyclohexane	Carbon tetrachloride*
sec-Butylbenzene	Phenanthrene	2-Hexanone*
tert-Butylbenzene	Phenol	Isopropylbenzene*
Cadmium	n-Propylbenzene	p-Isopropyltoluene*
Carbon tetrachloride	Pyrene	MEK*
Carbazole	Selenium	MIBK*
Chloroform	Silver	MTBE*
Chromium (hexavalent)	Styrene	n-Propylbenzene*
Chrysene	1,2,3,4-Tetrachlorobutane	Styrene*
Copper	PCE	1,2,3,4-Tetrachloroethane*
Dibenzo(a,h)anthracene	Tetrahydrofuran	1,2,3-Trichlorobenzene*
Dibenzofuran	Thallium	1,2,4-Trichlorobenzene*
Dichlorodifluoromethane	Toluene	1,2,4-Trimethylbenzene*
1,1-DCA	1,2,3-Trichlorobenzene	1,3,5-Trimethylbenzene*
1,2-DCA	1,2,4-Trichlorobenzene	
1,1-DCE	1,1,1-TCA	
cis-1,2-DCE	1,1,2-TCA	
4,4-DDD	TCE	
4,4-DDE	1,2,4-Trimethylbenzene	
4,4-DDT	1,3,5-Trimethylbenzene	
Di-n-butyl phthalate	Xylenes	
1,4-Dioxane		
Ethylbenzene		
2-Ethyl-1-hexanol		
Fluoranthene		
Fluorene		
Hexachlorobenzene		

Note: VOCs identified with an asterisk were added as COPCs in soil gas because they were detected in soil or groundwater.

TABLE A-4

CONCEPTUAL EVALUATION MODEL
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

SOIL PATHWAYS: Source	Transport Mechanism	Exposure Route	Future Receptors During Site Redevelopment: On-site Construction Worker	Future Receptors During Site Redevelopment: Off-site Occupational Worker	Future Receptors After Site Redevelopment: On-site Occupational Worker	Future Receptors After Site Redevelopment: On-site Gardener	Future Receptors After Site Redevelopment: Off-site Occupational Worker	Rationale
Surface and Subsurface Soil	Retained in Soils for Direct Contact	Incidental Ingestion of Soil / Sediment	**potentially complete**	incomplete	incomplete	**potentially complete**	incomplete	Future on-site construction workers and future on-site gardeners may have direct contact with on-site soil. The on-site occupational workers after redevelopment will work within on-site structures, and is not expected to have direct contact with on-site soil; since, the area of exposed impacted soil after redevelopment will be limited due to the presence of paved areas, buildings, and areas of imported "clean" soil such as landscaped areas.
		Dermal Contact with Soil / Sediment	**potentially complete**	incomplete	incomplete	**potentially complete**	incomplete	Same as above for incidental ingestion of soil.
		Ingestion of Plants/ Animals (biouptake)	incomplete	incomplete	incomplete	incomplete	incomplete	No agricultural plants or livestock are or will be present on-site.
	Air Transport	Inhalation of Fugitive Particulates	**potentially complete**	**potentially complete**	**insignificant**	**potentially complete**	**insignificant**	Fugitive dust will likely be generated during site redevelopment activities. After redevelopment, however, exposure to impacted soil will be limited, and is therefore considered insignificant, with the exception of the on-site gardener, due to the presence of paved areas, buildings, and areas of imported "clean" soil such as landscaped areas.
		Settleout: Dermal Exposure to and Ingestion of Deposited Particulates	**addressed by above-noted ingestion and dermal contact pathways**	addressed by above-noted ingestion and dermal contact pathways	addressed by above-noted ingestion and dermal contact pathways	**addressed by above-noted ingestion and dermal contact pathways**	addressed by above-noted ingestion and dermal contact pathways	Particulate deposition from fugitive dust during and after onsite redevelopment activities is considered negligible. Direct contact with soil is also addressed in the incidental ingestion of soil and dermal contact with soil pathways, described above.
		Inhalation of Emanating VOCs	**insignificant**	**potentially complete**	**potentially complete**	**insignificant**	**potentially complete**	Inhalation of volatile organic vapors from soil into ambient air is considered insignificant. However, potenial inhalation of volatile organic vapors into buildings is considered potentially complete for on-site and off-site occupational workers.
	Storm Water Runoff / Storm Drains	Incidental Ingestion of Storm Water Runoff	incomplete	incomplete	incomplete	incomplete	incomplete	It is assumed that storm water will be controlled during site redevelopment activities and that onsite construction workers will have limited contact with storm water. The generation of impacted storm water is considered to be limited after site development; since, the majority of the site will be paved or covered and storm water will drain into the storm drain system.
		Dermal Contact with Storm Water Runoff	**insignificant**	incomplete	incomplete	**insignificant**	incomplete	The on-site construction worker may have limited contact with storm water (see above). The generation of impacted storm water runoff is extremely limited after redevelopment and onsite storm water will drain into the storm drain system.
	Surface Water	Incidental Ingestion of Impacted Surface Water	incomplete	incomplete	incomplete	incomplete	incomplete	No surface water bodies exist on or adjacent to Parcel C.
		Dermal Contact with Impacted Surface Water	incomplete	incomplete	incomplete	incomplete	incomplete	No surface water bodies exist on or adjacent to Parcel C.
		Ingestion of Plants/ Animals (biouptake)	incomplete	incomplete	incomplete	incomplete	incomplete	No agricultural plants or livestock are or will be present on-site.

Notes:
Potentially Complete: Exposure pathway may exist for future receptor.
Incomplete: One or more criteria for a complete pathway do not exist.
Insignificant: All criteria exist for a complete exposure pathway, but data suggest low concentrations, low exposure frequency, potential insignificant risk, or insignificant pathway in comparison to other pathways.

TABLE A-4

CONCEPTUAL EVALUATION MODEL
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

GROUNDWATER PATHWAYS: Source	Transport Mechanism	Exposure Route	Future Receptors During Site Redevelopment: On-site Construction Worker	Future Receptors During Site Redevelopment: Off-site Occupational Worker	Future Receptors After Site Redevelopment: On-site Occupational Worker	Future Receptors After Site Redevelopment: On-site Gardener	Future Receptors After Site Redevelopment: Off-site Occupational Worker	Rationale
Surface Soil / Subsurface Soil → Leaching → Groundwater	Flow Movement to Groundwater Beneath the Subject Property	Ingestion of Groundwater	incomplete	incomplete	incomplete	incomplete	incomplete	Groundwater beneath Parcel C is not currently being used for municipal purposes. In addition, due to the natural quality of the upper water-bearing zone (Bellflower aquitard), it is assumed that the Bellflower aquitard will not be used in the future. The groundwater investigations conducted at Parcel C indicate that there are various chemical compounds and constituents detected in Bellflower aquitard groundwater beneath the property. Groundwater production in the vicinity of Parcel C is from a deeper regional aquifer system. The regional aquifer system has not been impacted by operations at Parcel C. Given the nature of the sediments of the Bellflower aquitard and the sediments between the Bellflower aquitard and the deep regional aquifer system, it is unlikely that the pathway for potential migration of chemical compounds and constituents detected in the Bellflower aquitard at Parcel C to the active production wells in the vicinity of Parcel C is complete.
		Dermal Contact with Groundwater	incomplete	incomplete	incomplete	incomplete	incomplete	See above rationale for ingestion of groundwater. The Bellflower aquitard is present at depths of approximately 65 feet bgs, and is not anticipated to be in direct contact with future receptors.
		Inhalation of VOCs from Groundwater	**insignificant**	**potentially complete**	**potentially complete**	**insignificant**	**potentially complete**	Inhalation of volatile organic vapors from migration of vapors from groundwater through vadose zone soil and into ambient air is considered insignificant. However, potenial inhalation of volatile organic vapors into buildings is considered potentially complete for on-site and off-site occupational workers.
		Ingestion of Plants/ Animals (biouptake)	incomplete	incomplete	incomplete	incomplete	incomplete	No agricultural plants or livestock are or will be present on-site, nor is property adjacent to the site used for agricultural purposes.
	Flow Movement to Domestic or Agricultural Wells	Ingestion of Domestic Groundwater	incomplete	incomplete	incomplete	incomplete	incomplete	See rationale for ingestion of groundwater.
		Dermal Contact with Domestic Groundwater	incomplete	incomplete	incomplete	incomplete	incomplete	See rationale for dermal contact with groundwater.
		Inhalation of VOCs from Domestic Groundwater	incomplete	incomplete	incomplete	incomplete	incomplete	Impacts to domestic groundwater are not considered to be complete at this time.
		Ingestion of Plants/ Animals (biouptake)	incomplete	incomplete	incomplete	incomplete	incomplete	No agricultural plants or livestock are or will be present on-site, nor is property adjacent to the site used for agricultural purposes.
	Flow Movement to Surface Water	Dermal Contact with Surface Water	incomplete	incomplete	incomplete	incomplete	incomplete	No surface water bodies exist on or adjacent to Parcel C.
		Incidental Ingestion while Swimming	incomplete	incomplete	incomplete	incomplete	incomplete	No surface water bodies exist on or adjacent to Parcel C.
		Ingestion of Plants/ Animals (biouptake)	incomplete	incomplete	incomplete	incomplete	incomplete	No agricultural plants or livestock are or will be present on-site, nor is property adjacent to the site used for agricultural purposes.

Notes:
Potentially Complete: Exposure pathway may exist for future receptor.
Incomplete: One or more criteria for a complete pathway do not exist.
Insignificant: All criteria exist for a complete exposure pathway, but data suggest low concentrations, low exposure frequency, potential insignificant risk, or insignificant pathway in comparison to other pathways.

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Acenaphthene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.15			NA	0.0000039
Acenaphthylene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.15			NA	0.0000028
Acetone	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.024			NA	0.0000039
	Inhalation of vapors in indoor air in a commercial structure	2.8			NA	0.0014
Anthracene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.12			NA	0.00000031
Aroclor 1248	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.019			4.8×10^{-8}	NA
Aroclor 1254	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.021			5.3×10^{-8}	0.0015

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Aroclor 1260	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.059			1.5×10^{-7}	NA
Arsenic	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	3.3			1.2×10^{-6}	0.0054
Benzo(a) anthracene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.11			6.2×10^{-8}	NA
Benzo(b) fluoranthene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.28			1.6×10^{-7}	NA
Benzo(k) fluoranthene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.27			1.5×10^{-7}	NA
Benzo(g,h,i) perylene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.21			NA	0.0000039
Benzo(a)pyrene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.26			1.5×10^{-6}	NA

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Bis(2-ethylhexyl) phthalate	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.14			1.7×10^{-10}	0.0000079
n-Butylbenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0082			NA	0.000015
	Inhalation of vapors in indoor air in a commercial structure	0.70			NA	0.038
sec-Butylbenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0054			NA	0.000013
	Inhalation of vapors in indoor air in a commercial structure	0.32			NA	0.031
tert-Butylbenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0038			NA	0.0000075
	Inhalation of vapors in indoor air in a commercial structure	0.034			NA	0.0022
Cadmium	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.34			2.7×10^{-10}	0.00068

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Carbon tetrachloride	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0018			9.6×10^{-9}	0.000017
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA
Carbazole	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.43			3.4×10^{-9}	NA
Chloroform	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0036			1.7×10^{-9}	0.0028
	Inhalation of vapors in indoor air in a commercial structure			3	4.0×10^{-9}	0.0000074
Chromium (hexavalent)	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.31			8.4×10^{-9}	0.000030
Chrysene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.12			6.8×10^{-9}	NA
Copper	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	24			NA	0.00032

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Dibenzo(a,h) anthracene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.096			1.9×10^{-7}	NA
Dibenzofuran	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.14			NA	0.000028
Dichlorodi-fluoromethane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0033			NA	0.000011
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA
1,1-DCA	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0036			NA	0.0000018
	Inhalation of vapors in indoor air in a commercial structure			6	1.8×10^{-9}	0.0000067
1,2-DCA	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0035			3.5×10^{-9}	0.0000013
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
1,1-DCE	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0046			NA	0.000031
	Inhalation of vapors in indoor air in a commercial structure			79	NA	0.00076
cis-1,2-DCE	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0038			NA	0.000026
	Inhalation of vapors in indoor air in a commercial structure			8	NA	0.00013
4,4-DDD	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0061			3.5×10^{-10}	NA
4,4-DDE	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0095			7.8×10^{-10}	NA
4,4-DDT	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0044			3.6×10^{-10}	0.0000061
Di-n-butyl phthalate	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.19			NA	0.0000022

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
1,4-Dioxane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.014			1.5×10^{-10}	NA
Ethylbenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.029			NA	0.0000025
	Inhalation of vapors in indoor air in a commercial structure				< 40	NA
2-Ethyl-1-hexanol	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	1.4			NA	0.000016
	Inhalation of vapors in indoor air in a commercial structure	1.4			NA	0.00010
Fluoranthene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.16			NA	0.0000053
Fluorene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.12			NA	0.0000036
Hexachloro-benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.12			8.8×10^{-8}	0.00018

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
2-Hexanone	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	< 1.2			NA	NA
	Inhalation of vapors in indoor air in a commercial structure	0.014			3.9×10^{-9}	0.0000028
Hydrogen cyanide	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.22			NA	0.0022
Indeno(1,2,3-cd) perylene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.19			1.1×10^{-7}	NA
Isopropyl benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0071			NA	0.000014
	Inhalation of vapors in indoor air in a commercial structure	0.098			NA	0.025
p-Isopropyl-toluene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0064			NA	0.000012
	Inhalation of vapors in indoor air in a commercial structure	0.48			NA	0.12

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Mercury	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.05			NA	0.000082
Methylene chloride	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0044			4.6×10^{-10}	0.0000030
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA
Methyl ethyl ketone	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.028			NA	0.0000020
	Inhalation of vapors in indoor air in a commercial structure	8,700			NA	0.012
4-Methyl-2-pentanone	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.022			NA	0.0000077
	Inhalation of vapors in indoor air in a commercial structure	1,300			NA	0.028
MTBE	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0039			1.1×10^{-10}	NA
	Inhalation of vapors in indoor air in a commercial structure	0.021			5.9×10^{-9}	0.0000043

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
2-Methyl-naphthalene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.17			NA	0.0000031
Molybdenum	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	1.0			NA	0.00010
Naphthalene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.21			NA	0.00037
Nitrobenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.14			NA	0.0014
1-Nitro-1,1-dichloroethane *	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.27			NA	NA
1-Ocylcyclohexane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	Not identified as a TIC				
	Inhalation of vapors in indoor air in a commercial structure	0.011			NA	0.00000040

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Phenanthrene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.21			NA	0.0000039
Phenol	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.14			NA	0.00000027
n-Propylbenzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0047			NA	0.0000083
	Inhalation of vapors in indoor air in a commercial structure	0.33			NA	0.018
Pyrene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.14			NA	0.0000026
Selenium	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.66			NA	0.000066
Silver	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.47			NA	0.000047

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Styrene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	< 0.500			NA	NA
	Inhalation of vapors in indoor air in a commercial structure		0.64		NA	0.0000000064
1,2,3,4-Tetra-chlorobutane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.56			6.1×10^{-7}	0.00014
	Inhalation of vapors in indoor air in a commercial structure	0.56			6.3×10^{-6}	0.0016
1,1,2,2-Tetrachloro-ethane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	< 0.250			NA	NA
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA
Tetrachloro-ethene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0040			1.9×10^{-9}	0.000024
	Inhalation of vapors in indoor air in a commercial structure	25			2.7×10^{-8}	0.00038
Tetrahydrofuran	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.017			5.2×10^{-11}	0.000000091

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
Thallium	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	1.5			NA	0.012
Toluene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0059			NA	0.0000038
	Inhalation of vapors in indoor air in a commercial structure	7.0			NA	0.000015
1,2,3-Trichloro-benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0038			NA	0.00000051
	Inhalation of vapors in indoor air in a commercial structure	0.0039			NA	0.0000026
1,2,4-Trichloro-benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0040			NA	0.00000053
	Inhalation of vapors in indoor air in a commercial structure	0.0040			NA	0.0000027
1,1,1-Trichloro-ethane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0066			NA	0.0000020
	Inhalation of vapors in indoor air in a commercial structure	6.0			NA	0.0000035

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
1,1,2-Trichloro-ethane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0035			NA	0.000022
	Inhalation of vapors in indoor air in a commercial structure			< 40	NA	NA
Trichloro-ethylene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0098			2.7×10^{-9}	0.0000051
	Inhalation of vapors in indoor air in a commercial structure	275			1.7×10^{-7}	0.00027
Trichloro-fluoromethane	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	< 0.250			NA	NA
	Inhalation of vapors in indoor air in a commercial structure	4			NA	0.0000037
1,2,4-Trimethyl-benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.016			NA	0.000094
	Inhalation of vapors in indoor air in a commercial structure	1.9			NA	0.20
1,3,5-Trimethyl-benzene	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.0066			NA	0.00094

TABLE A-5

SUMMARY OF SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT RESULTS
COMMERCIAL/LIGHT INDUSTRIAL REDEVELOPMENT SCENARIO
ON-SITE INDUSTRIAL WORKER
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Chemical	Pathway	Soil Concentration (mg/kg)	Groundwater Concentration (ug/l)	Soil Gas Concentration (mg/m^3)	Excess Lifetime Cancer Risk	Hazard Index
1,3,5-Trimethyl-benzene (cont'd)	Inhalation of vapors in indoor air in a commercial structure	0.68			NA	0.39
Xylenes	Incidental ingestion of soil, dermal contact with soil, inhalation of fugitive dust, inhalation of vapors into ambient air	0.26			NA	0.000058
	Inhalation of vapors in indoor air in a commercial structure	13			NA	0.000010
Total					4.6×10^{-6}	0.90

NA = Not applicable
* = No toxicity values available
TIC = Tentatively Identified Compound

TABLE A-6

SUMMARY OF POTENTIAL FOR FIRE/EXPLOSION HAZARD

Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Organic Chemicals	Concentrations in Soil Gas (ug/l or mg/m^3)			Potential for Fire/ Explosive Hazard Yes/No
	Maximum Parcel C Concentration (12-foot depth)	Maximum Estimated Concentration #	20% LEL Concentration (1 through 7)	
Acetone	NA	27	11,881	No
n-Butylbenzene	NA	119	8,507	No
sec-Butylbenzene	NA	96.9	8,507	No
tert-Butylbenzene	NA	7.0	8,507	No
Chloroform	3		NF	No
1,1-Dichloroethane	6		43,730	No
1,1-Dichloroethylene	79		44,434	No
cis-1,2-Dichloroethylene	8		44,434	No
2-Ethyl-1-hexanol (surrogate=butanol)	NA	2.9	8,486	No
2-Hexanone	NA	1.9	65,571	No
Isopropyl benzene	NA	848	8,834	No
p-Isopropyltoluene	NA	4,150	7,673	No
Methyl ethyl ketone (MEK)	NA	55,700	8,257	Yes**
4-Methyl-2-Pentanone (MIBK)	NA	24,500	9,836	Yes**
Methyl tert-butyl ether	NA	2.9	11,537	No
1-Octyl cyclohexane (surrogate=ethylbenzene)	NA	8.6	6,950	No
n-Propylbenzene	NA	56.7	7,853	No
Styrene	NA	0.07	7,671	No
1,2,3,4-Tetrachlorobutane (surrogate=PCE)	NA	31.3	NF	No
Tetrachloroethene (PCE)	25		NF	No
Toluene	7		8,287	No
1,2,3-Trichlorobenzene (surrogate=1,2,4-Trichlorobenzene)	NA	0.12	37,096	No
1,2,4-Trichlorobenzene	NA	0.12	37,096	No
1,1,1-Trichloroethane	6		81,840	No
Trichloroethylene	275		85,988	No
Trichlorofluoromethane	4		NF	No
1,2,4-Trimethylbenzene	NA	108	8,849	No
1,3,5-Trimethylbenzene	NA	206	NF	No
Xylenes	13		9,556	No

Concentrations greater than 20% of the LEL concentration shown in bold.

* Maximum sample quantitation limit (SQL) presented when all results reported as nondetect

\# Estimated maximum soil gas concentration using the vapor model and maximum soil and maximum groundwater concentration results (see calculations in Appendices B)

NA = Not analyzed

NF = Nonflammable

(1) National Institute for Occupational Safety and Health (NIOSH), 1997. *Pocket Guide to Chemical Hazards.*

(2) MSDS Solutions. Material Safety Data Sheet (MSDS) for Dichloroethane, Pharmco, August 23, 1999, http://www.msdssolutions.com

(3) Cornell University Website, Material Safety Data Sheet (MSDS) for n-Butylbenzene, Polyscience, Inc., August 1, 1992, http://msds.pdc.cornell.edu/

(4) MSDS Solutions. Material Safety Data Sheet (MSDS) for sec-Butylbenzene, Sigma Aldrich, October 2000, http://www.msdssolutions.com

(5) MSDS Solutions. Material Safety Data Sheet (MSDS) for Isopropyltoluene, Sigma Aldrich, October 2000, http://www.msdssolutions.com

(6) MSDS Solutions. Material Safety Data Sheet (MSDS) for Tetrachloroethylene, Anachemia, January 25, 1996, http://www.msdssolutions.com

(7) MSDS Solutions. Material Safety Data Sheet (MSDS) for Tetrachloroethylene, Aldrich Chemical, Inc., August 2000, http://www.msdssolutions.com

** The following samples have estimated pore space concentrations of MEK and/or MIBK that exceed 20 percent of the corresponding LEL: PD-27 (MEK of 8,700,000 ug/kg at 60 feet bgs, MIBK of 1,300,000 ug/kg at 60 feet bgs, MIBK of 650,000 ug/kg at 50 feet bgs) and 2BB-36-13 (MEK of 1,700,000 ug/kg at 29 feet bgs). Each of these samples (identified in Figure A-2) was collected from the Building 1 area undergoing remediation by soil vapor extraction.

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

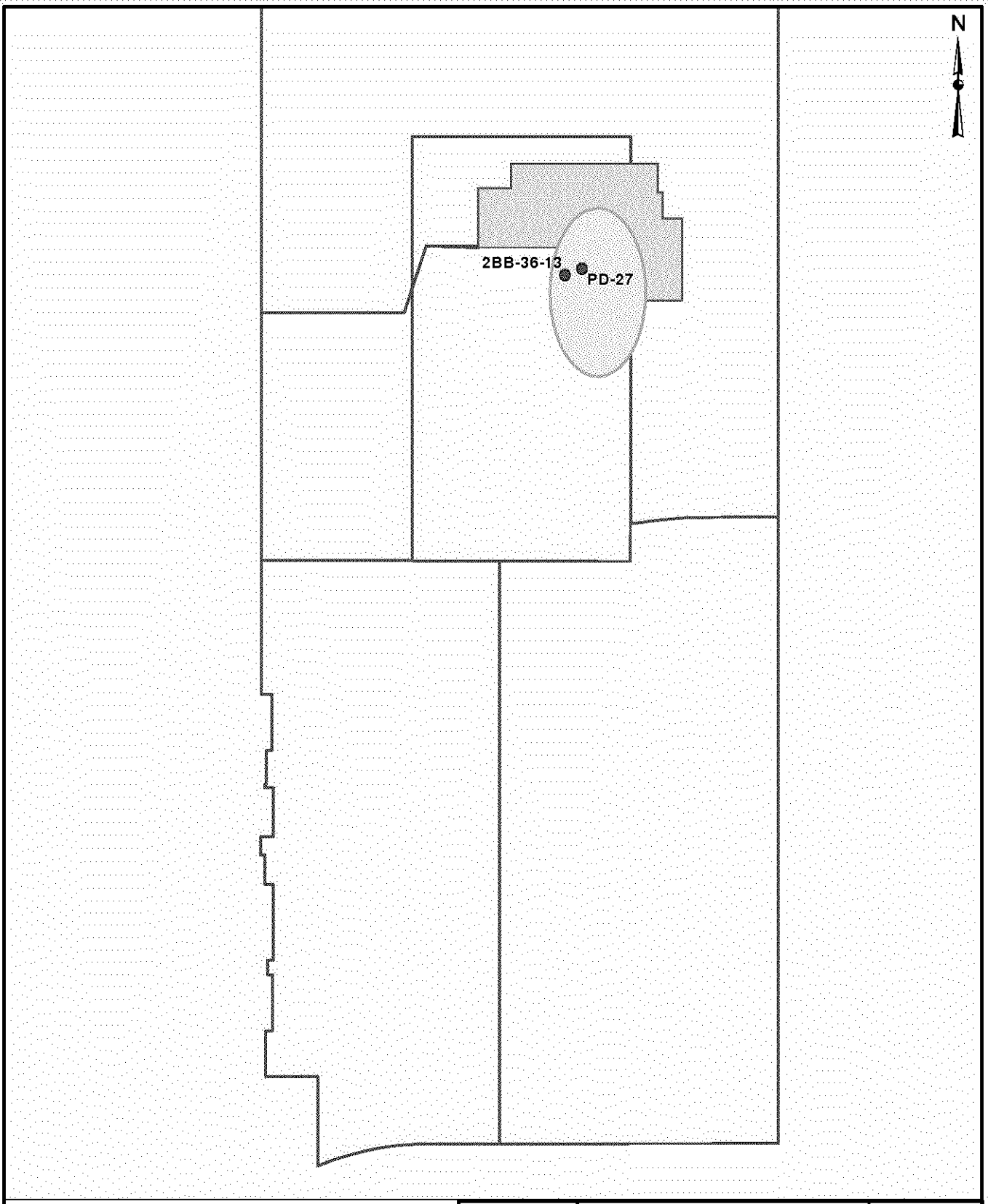
BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

FIGURE: **A-1**

SURROUNDING PROPERTIES IN PROXIMITY TO PARCEL C OF BRC FORMER C-6 FACILITY

SCALE: AS SHOWN		PROJECT: 27315-400
DRAWN: SAL	REVIEWED: -	DATE: 12 MARCH 2002

G:\PROJECTS\ENVIRONMENTAL\BOEING\C-6\PARCEL C\FIGURE A-1 - SURROUNDING PROPERTIES IN PROXIMITY TO PARCEL C OF BRC FORMER C-6 FACILITY



Legend

- Sample Location
- Easement
- Approximate Building 1 Soil Vapor Extraction Remediation Area

0 100 200 400 Feet

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

FIGURE A-2

Samples with Estimated Pore Gas Concentration Greater than 20% of LEL

SCALE : AS SHOWN		PROJECT : 27315-400
DRAWN : DFM	REVIEWED : SPZ	DATE : 12 MARCH 2002

APPENDIX B

Screening-level Risk Assessment Calculations

Exposure Point Concentration Calculations for Shallow Soil

SUMMARY OF SHALLOW SOIL EXPOSURE POINT CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

Analyte	Units	Mazimum Parcel C Concentration	95% UCL	Rational for Selection of 95% UCL	EPC (Lesser of 95% UCL and Maximum Concentration)
Volatile Organic Compounds (VOCs)					
Acetone	ug/kg	1,800	24	Highest(1)	24
n-Butylbenzene	ug/kg	690	8.2	Highest(1)	8.2
sec-Butylbenzene	ug/kg	320	5.4	Highest(1)	5.4
tert-Butylbenzene	ug/kg	34	3.8	Highest(2)	3.8
Carbon tetrachloride	ug/kg	1.8	3.5	Highest(2)	1.8
Chloroform	ug/kg	15	3.6	Highest(1)	3.6
Dichlorodifluoromethane	ug/kg	3.3	6.7	Highest(2)	3.3
1,1-Dichloroethane	ug/kg	24	3.6	Highest(2)	3.6
1,2-Dichloroethane	ug/kg	4.6	3.5	Highest(2)	3.5
1,1-Dichloroethylene	ug/kg	220	4.6	Highest(1)	4.6
cis-1,2-Dichloroethene	ug/kg	140	3.8	Highest(2)	3.8
Ethylbenzene	ug/kg	11,000	29	Highest(1)	29
2-Ethyl-1-hexanol	ug/kg	1,400	NA	NA	1400
Isopropylbenzene	ug/kg	98	7.1	Highest(2)	7.1
p-Isopropyltoluene	ug/kg	480	6.4	Highest(1)	6.4
Methylene chloride	ug/kg	53	4.4	Highest(1)	4.4
2-Butanone (MEK)	ug/kg	6,300	28	Highest(2)	28
4-Methyl-2-Pentanone (MIBK)	ug/kg	840	22	Highest(2)	22
MTBE	ug/kg	21	3.9	Highest(1)	3.9
n-Propylbenzene	ug/kg	330	4.7	Highest(2)	4.7
1,2,3,4-Tetrachlorobutane	ug/kg	560	NA	NA	560
Tetrachloroethylene	ug/kg	160	4.0	Highest(1)	4.0
Toluene	ug/kg	1,200	5.9	Highest(1)	5.9
1,2,3-Trichlorobenzene	ug/kg	3.9	3.8	Highest(2)	3.8
1,2,4-Trichlorobenzene	ug/kg	4.0	13	Highest(2)	4.0
1,1,1-Trichloroethane	ug/kg	930	6.6	Highest(1)	6.6
1,1,2-Trichloroethane	ug/kg	6.4	3.5	Highest(2)	3.5
Trichloroethylene	ug/kg	340	9.8	Highest(1)	9.8
1,2,4-Trimethylbenzene	ug/kg	1,900	16	Highest(1)	16
1,3,5-Trimethylbenzene	ug/kg	680	6.6	Highest(1)	6.6
Xylenes	ug/kg	120,000	260	Highest(1)	260
Semi-Volatile Organic Compounds (SVOCs)					
Bis(2-ethylhexyl)phthalate	ug/kg	62,000	140	Highest(1)	140
Carbazole	ug/kg	450	430	Highest(1)	430
Dibenzofuran	ug/kg	260	140	Highest(2)	140
Di-n-butyl phthalate	ug/kg	330	190	Highest(2)	190
1,4-Dioxane	ug/kg	14	30	Highest(1)	14
Hexachlorobenzene	ug/kg	120	140	Highest(2)	120
Nitrobenzene	ug/kg	390	140	Highest(2)	140
1-Nitro-1,1-dichloroethane	ug/kg	270	NA	NA	270

SUMMARY OF SHALLOW SOIL EXPOSURE POINT CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

Analyte	Units	Mazimum Parcel C Concentration	95% UCL	Rational for Selection of 95% UCL	EPC (Lesser of 95% UCL and Maximum Concentration)
Phenol	ug/kg	150	140	Highest[2]	140
Tetrahydrofuran	ug/kg	24	17	Highest[2]	17
Pesticides					
4,4-DDD	ug/kg	90	6.1	Highest[1]	6.1
4,4-DDE	ug/kg	130	9.5	Highest[1]	9.5
4,4-DDT	ug/kg	65	4.4	Highest[1]	4.4
Polychlorinated Biphenyls (PCBs)					
Aroclor-1248	ug/kg	110	19	Highest[1]	19
Aroclor-1254	ug/kg	230	21	Highest[1]	21
Aroclor-1260	ug/kg	930	59	Highest[1]	59
Polynuclear Aromatic Hydrocarbons (PAHs)					
Acenaphthene	ug/kg	3,000	150	Lognormal	150
Acenaphthylene	ug/kg	9,200	150	Lognormal	150
Anthracene	ug/kg	1,700	120	Lognormal	120
Benzo(a)anthracene	ug/kg	4,900	110	Lognormal	110
Benzo(a)pyrene	ug/kg	6,100	260	Lognormal	260
Benzo(b)fluoranthene	ug/kg	7,000	280	Lognormal	280
Benzo(k)fluoranthene	ug/kg	3,800	270	Lognormal	270
Benzo(g,h,i)perylene	ug/kg	3,100	210	Lognormal	210
Chrysene	ug/kg	5,900	120	Lognormal	120
Dibenzo(a,h)anthracene	ug/kg	900	96	Lognormal	96
Fluoranthene	ug/kg	4,600	160	Lognormal	160
Fluorene	ug/kg	4,100	120	Lognormal	120
Indeno(1,2,3-cd)pyrene	ug/kg	2,000	190	Lognormal	190
2-Methylnaphthalene	ug/kg	22,000	170	Lognormal	170
Naphthalene	ug/kg	4,800	210	Lognormal	210
Phenanthrene	ug/kg	11,000	210	Lognormal	210
Pyrene	ug/kg	3,900	140	Lognormal	140
Metals					
Arsenic	mg/kg	23.5	3.3	Normal	3.3
Cadmium	mg/kg	52.9	0.34	Lognormal	0.34
Chromium (hexavalent)	mg/kg	2.5	0.31	Highest[1]	0.31
Copper	mg/kg	1,100	24	Normal	24
Lead	mg/kg	1,020	9.8	Normal	9.8
Mercury	mg/kg	0.6	0.05	Highest[1]	0.05
Molybdenum	mg/kg	12	1.0	Lognormal	1.0
Selenium	mg/kg	14	0.66	Highest[1]	0.66
Silver	mg/kg	4.2	0.47	Highest[1]	0.47
Thallium	mg/kg	3	1.5	Lognormal	1.5
Other Inorganics					
Hydrogen cyanide	mg/kg	0.22	0.25	Highest[1]	0.22

SUMMARY OF SHALLOW SOIL EXPOSURE POINT CONCENTRATIONS

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

UCL - Upper Confidence Limit
EPC - Exposure Point Concentration (for shallow soil) = the lower of the maximum concentration and the 95% UCL
NA - Not Applicable (95 % UCLs were not calculated for 2-Ethyl-1-hexanol, 1-Nitro-1,1-dichloroethane, and 1,2,3,4-Tetrachlorobutane, since these chemicals were only analyzed for in one sample)

1. D'Agostino Analysis indicates distribution of untransformed and log transformed data do not meet criterion for normality. Based on review of histograms, it is unclear whether either of the above data sets are normal or lognormal. Therefore, the highest UCL was selected for comparison to maximum detected concentration.

2. Where data set has less than 1% detections, the highest UCL was selected.

Note - Concentrations for samples with duplicate sample results or with more than one result due to analysis using multiple metho were chosen as follows:

1. Two non-detect results, lowest non detect concentration selected.
2. One detect and one non-detect, detected concentration selected.
3. Two detected values, maximum detected concentration selected.

Note - D'Agostino was calculated for those chemicals with greater than 1% detection and greater than 10 sample detections. D'Agostino test was not calculated for chemicals with greater than 1000 samples analyzed.

ACETONE

Untransformed		Log Transformed	
Mean	19.90203851	Mean	2.603527205
Standard Error	2.609304375	Standard Error	0.014614367
Median	12.5	Median	2.525728644
Mode	12.5	Mode	2.525728644
Standard Deviation	77.53630381	Standard Deviation	0.434270523
Sample Variance	6011.878409	Sample Variance	0.188590887
Kurtosis	335.6059629	Kurtosis	60.42879086
Skewness	16.62211531	Skewness	7.311124721
Range	1793.5	Range	5.623739767
Minimum	6.5	Minimum	1.871802177
Maximum	1800	Maximum	7.495541944
Sum	17573.5	Sum	2298.914522
Count	883	Count	883
Largest(1)	1800	Largest(1)	7.495541944
Smallest(1)	6.5	Smallest(1)	1.871802177
Confidence Level(95.0%)	5.121171411	Confidence Level(95.0%)	0.028683

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	9	1.02%
20	834	95.47%
30	16	97.28%
40	6	97.96%
50	0	97.96%
60	3	98.30%
70	3	98.64%
80	0	98.64%
90	0	98.64%
100	1	98.75%
More	11	100.00%

Normal Distribution (95% UCL)

24.20

H = 1.744

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **15.23**

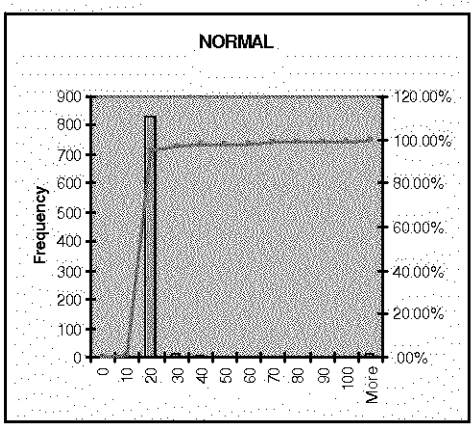
X. = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

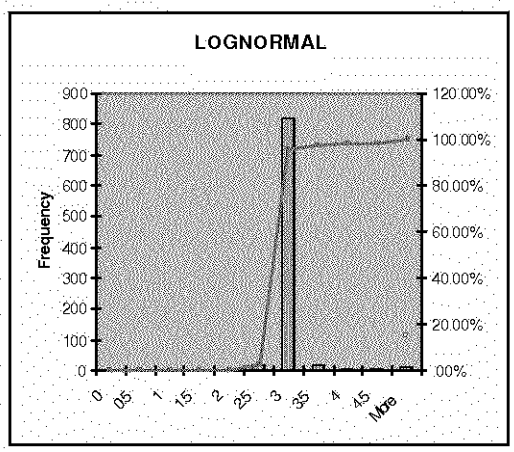
UCL = upper confiedence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	0	.00%
1	0	.00%
1.5	0	.00%
2	1	.11%
2.5	21	2.49%
3	821	95.47%
3.5	18	97.51%
4	4	97.96%
4.5	6	98.64%
More	12	100.00%



N-BUTYLBENZENE

Untransformed		Log Transformed	
Mean	6.060469667	Mean	0.885102457
Standard Error	1.278798809	Standard Error	0.01825545
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	40.88157987	Standard Deviation	0.58360365
Sample Variance	1671.303573	Sample Variance	0.340593221
Kurtosis	195.1621338	Kurtosis	50.88217724
Skewness	13.47038725	Skewness	6.261193423
Range	688.75	Range	6.313548046
Minimum	1.25	Minimum	0.223143551
Maximum	690	Maximum	6.536691598
Sum	6193.8	Sum	904.5747107
Count	1022	Count	1022
Largest(1)	690	Largest(1)	6.536691598
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	2.509373332	Confidence Level(95.0%)	0.035822477

Normal Distribution (95% UCL)

8.17

H = 1.808

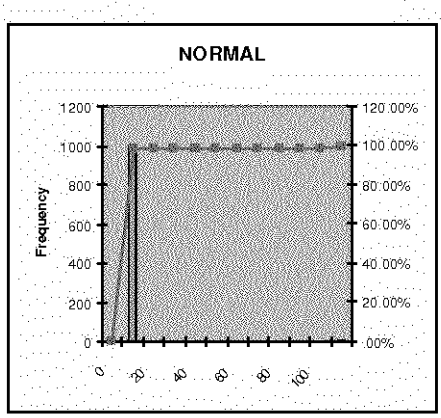
Lognormal Distribution (95% UCL)

UCL = e.^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.97**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confidence limit
n = number of samples

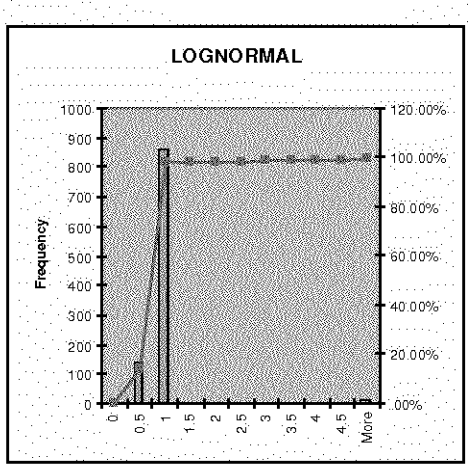
Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1005	98.34%
20	2	98.53%
30	2	98.73%
40	1	98.83%
50	0	98.83%
60	0	98.83%
70	0	98.83%
80	0	98.83%
90	1	98.92%
100	0	98.92%
More	11	100.00%



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	142	13.89%
1	861	98.14%
1.5	1	98.24%
2	1	98.34%
2.5	0	98.34%
3	2	98.53%
3.5	3	98.83%
4	0	98.83%
4.5	1	98.92%
More	11	100.00%



SEC-BUTYLBENZENE

Untransformed		Log Transformed	
Mean	4.325831703	Mean	0.87000823
Standard Error	0.654929916	Standard Error	0.016082576
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	20.93724879	Standard Deviation	0.514139603
Sample Variance	438.3683869	Sample Variance	0.264339531
Kurtosis	148.6446775	Kurtosis	51.5630456
Skewness	11.86127115	Skewness	6.097831093
Range	318.75	Range	5.545177444
Minimum	1.25	Minimum	0.223143551
Maximum	320	Maximum	5.768320996
Sum	4421	Sum	889.1484113
Count	1022	Count	1022
Largest(1)	320	Largest(1)	5.768320996
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.285160063	Confidence Level(95.0%)	0.031558668

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1008	98.63%
20	2	98.83%
30	1	98.92%
40	0	98.92%
50	1	99.02%
60	0	99.02%
70	0	99.02%
80	0	99.02%
90	1	99.12%
100	0	99.12%
More	9	100.00%

Normal Distribution (95% UCL)

5.40

H = 1.776

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)] **2.80**

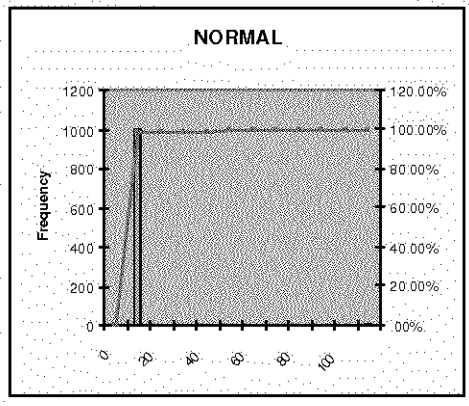
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

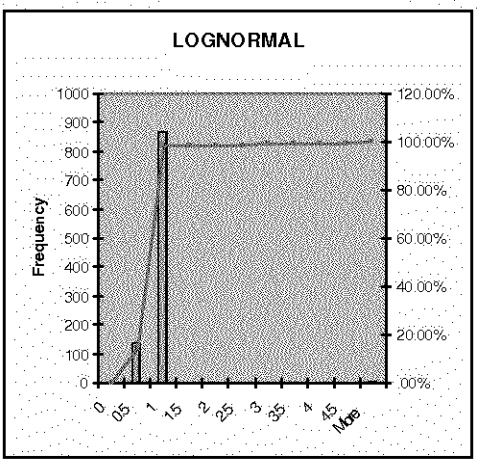
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	142	13.89%
1	866	98.63%
1.5	0	98.63%
2	0	98.63%
2.5	1	98.73%
3	1	98.83%
3.5	1	98.92%
4	1	99.02%
4.5	1	99.12%
More	9	100.00%



TERT-BUTYLBENZENE

Untransformed		*Log Transformed*	
Mean	3.245107632	Mean	0.857205136
Standard Error	0.319010123	Standard Error	0.013548782
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	10.19834998	Standard Deviation	0.433137428
Sample Variance	104.0063423	Sample Variance	0.187608032
Kurtosis	137.1802091	Kurtosis	48.86628379
Skewness	11.71861477	Skewness	5.369116016
Range	123.75	Range	4.605170186
Minimum	1.25	Minimum	0.223143551
Maximum	125	Maximum	4.828313737
Sum	3316.5	Sum	876.0636487
Count	1022	Count	1022
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.625990178	Confidence Level(95.0%)	0.026586632

Normal Distribution (95% UCL)

3.77

Histogram not run for less than 1% detection

H = 1.742

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

2.65

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

CHLOROFORM

Untransformed		Log Transformed	
Mean	3.120759289	Mean	0.866746
Standard Error	0.262842216	Standard Error	0.011514
Median	2.5	Median	0.916291
Mode	2.5	Mode	0.916291
Standard Deviation	9.248162285	Standard Deviation	0.405121
Sample Variance	85.52850565	Sample Variance	0.164123
Kurtosis	168.5289463	Kurtosis	52.02364
Skewness	12.98072167	Skewness	5.357172
Range	124	Range	4.828314
Minimum	1	Minimum	0
Maximum	125	Maximum	4.828314
Sum	3863.5	Sum	1073.032
Count	1238	Count	1238
Largest(1)	125	Largest(1)	4.828314
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	0.515666112	Confidence Level(95.0%)	0.022589

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1222	98.71%
20	9	99.43%
30	0	99.43%
40	0	99.43%
50	0	99.43%
60	0	99.43%
70	0	99.43%
80	0	99.43%
90	0	99.43%
100	0	99.43%
More	7	100.00%

Normal Distribution (95% UCL)

3.55

H = 1.730

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)]

2.63

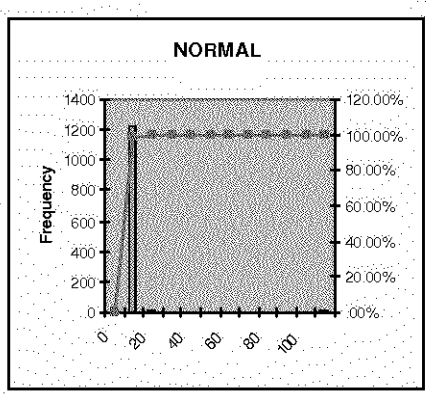
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

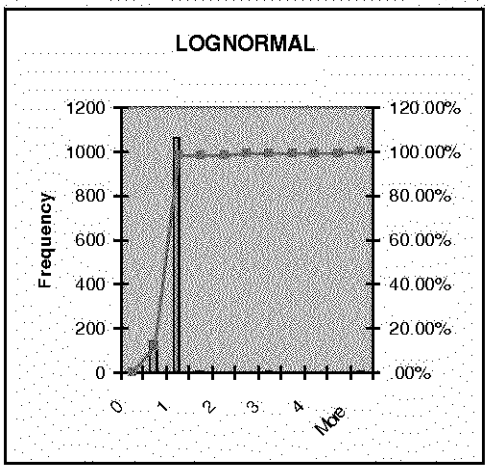
UCL = upper confiedence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	1	.08%
0.5	150	12.20%
1	1063	98.06%
1.5	7	98.63%
2	0	98.63%
2.5	2	98.79%
3	8	99.43%
3.5	0	99.43%
4	0	99.43%
4.5	0	99.43%
More	7	100.00%



DICHLORODIFLUOROMETHANE

Untransformed		*Log Transformed*	
Mean	5.796560847	Mean	1.373400576
Standard Error	0.575011646	Standard Error	0.017629967
Median	5	Median	1.609437912
Mode	5	Mode	1.609437912
Standard Deviation	19.36346916	Standard Deviation	0.593687665
Sample Variance	374.9439379	Sample Variance	0.352465044
Kurtosis	154.1216519	Kurtosis	14.03778452
Skewness	12.41766718	Skewness	1.38494014
Range	248.75	Range	5.298317367
Minimum	1.25	Minimum	0.223143551
Maximum	250	Maximum	5.521460918
Sum	6573.3	Sum	1557.436254
Count	1134	Count	1134
Largest(1)	250	Largest(1)	5.521460918
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.128208509	Confidence Level(95.0%)	0.034591089

Normal Distribution (95% UCL)
6.74

H = 1.813

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **4.86**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

Histogram not run for less than 1% detection

1,1 DICHLOROETHANE

Untransformed		*Log Transformed*	
Mean	3.13882163	Mean	0.872388319
Standard Error	0.263017009	Standard Error	0.011485953
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	9.258049272	Standard Deviation	0.404299032
Sample Variance	85.71147632	Sample Variance	0.163457707
Kurtosis	167.5779246	Kurtosis	52.67444115
Skewness	12.9313713	Skewness	5.458905832
Range	123.75	Range	4.605170186
Minimum	1.25	Minimum	0.223143551
Maximum	125	Maximum	4.828313737
Sum	3889	Sum	1080.889127
Count	1239	Count	1239
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.51600784	Confidence Level(95.0%)	0.022534064

Normal Distribution (95% UCL)

3.57

Histogram not run for less than 1% detections

H = 1.730

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.65**

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

1,2 DICHLOROETHANE

Untransformed		*Log Transformed*	
Mean	3.092897498	Mean	0.863963
Standard Error	0.262188132	Standard Error	0.011145
Median	2.5	Median	0.916291
Mode	2.5	Mode	0.916291
Standard Deviation	9.228873289	Standard Deviation	0.392287
Sample Variance	85.17210218	Sample Variance	0.153889
Kurtosis	169.9812174	Kurtosis	58.68545
Skewness	13.05725275	Skewness	5.698886
Range	124	Range	4.828314
Minimum	1	Minimum	0
Maximum	125	Maximum	4.828314
Sum	3832.1	Sum	1070.451
Count	1239	Count	1239
Largest(1)	125	Largest(1)	4.828314
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	0.514381684	Confidence Level(95.0%)	0.021865

Normal Distribution (95% UCL)

3.52

H = 1.726

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{.05})$]

2.61

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

Histogram not run for less than 1% detections

1,1-DICHLDRDETHENE

Untransformed		Log Transformed	
Mean	4.060653753	Mean	0.94347091
Standard Error	0.3507833	Standard Error	0.016311549
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	12.34737285	Standard Deviation	0.574157263
Sample Variance	152.4576166	Sample Variance	0.329656562
Kurtosis	128.9722904	Kurtosis	22.21959272
Skewness	10.44312893	Skewness	4.093215477
Range	218.75	Range	5.170483995
Minimum	1.25	Minimum	0.223143551
Maximum	220	Maximum	5.393627546
Sum	5031.15	Sum	1168.960458
Count	1239	Count	1239
Largest(1)	220	Largest(1)	5.393627546
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.688194782	Confidence Level(95.0%)	0.032001304

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1194	96.37%
20	20	97.98%
30	7	98.55%
40	2	98.71%
50	0	98.71%
60	5	99.11%
70	2	99.27%
80	1	99.35%
90	0	99.35%
100	0	99.35%
More	8	100.00%

Normal Distribution (95% UCL)

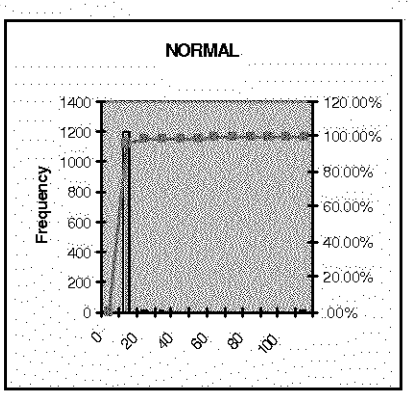
4.64

H = 1.804

Lognormal Distribution (95% UCL)

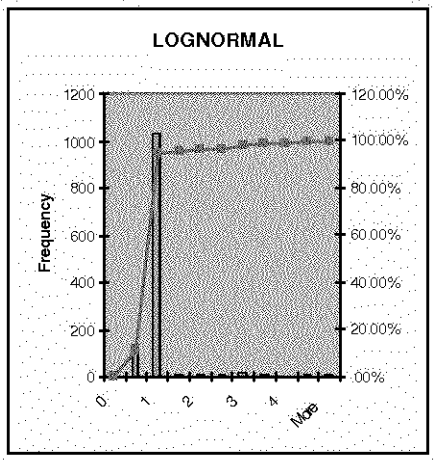
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **3.12**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confidence limit
n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	140	11.30%
1	1034	94.75%
1.5	6	95.24%
2	8	95.88%
2.5	8	96.53%
3	18	97.98%
3.5	7	98.55%
4	3	98.79%
4.5	7	99.35%
More	8	100.00%



CIS 1,2 DICHLOROETHENE

Untransformed		*Log Transformed*	
Mean	3.277759197	Mean	0.881178679
Standard Error	0.295200394	Standard Error	0.012030001
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	10.208984	Standard Deviation	0.416036337
Sample Variance	104.2233543	Sample Variance	0.173086234
Kurtosis	143.0411294	Kurtosis	55.11547349
Skewness	11.96837635	Skewness	5.855382084
Range	138.75	Range	4.718498871
Minimum	1.25	Minimum	0.223143551
Maximum	140	Maximum	4.941642423
Sum	3920.2	Sum	1053.8897
Count	1196	Count	1196
Largest(1)	140	Largest(1)	4.941642423
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.579169263	Confidence Level(95.0%)	0.023602296

Normal Distribution (95% UCL)

3.76

H = 1.735

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

2.69

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

Histogram not run for less than 1% detections

ETHYLBENZENE

Untransformed		Log Transformed	
Mean	13.88603713	Mean	0.88990651
Standard Error	9.025334354	Standard Error	0.015093568
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	317.6866412	Standard Deviation	0.531285005
Sample Variance	100924.802	Sample Variance	0.282263756
Kurtosis	1159.052649	Kurtosis	93.52178388
Skewness	33.65745651	Skewness	7.98064728
Range	10999	Range	9.305650552
Minimum	1	Minimum	0
Maximum	11000	Maximum	9.305650552
Sum	17204.8	Sum	1102.594166
Count	1239	Count	1239
Largest(1)	11000	Largest(1)	9.305650552
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	17.70562401	Confidence Level(95.0%)	0.02961177

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1222	98.63%
20	5	99.03%
30	0	99.03%
40	0	99.03%
50	1	99.11%
60	0	99.11%
70	0	99.11%
80	0	99.11%
90	1	99.19%
100	0	99.19%
More	10	100.00%

Normal Distribution (95% UCL)

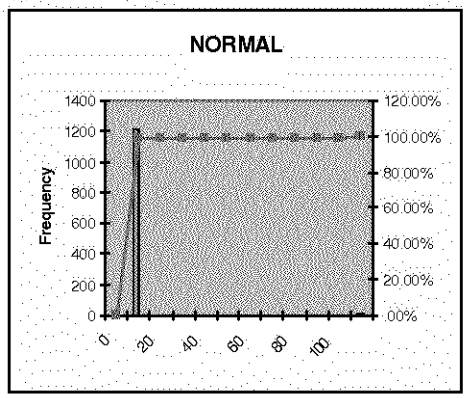
28.74

H = 1.784

Lognormal Distribution (95% UCL)

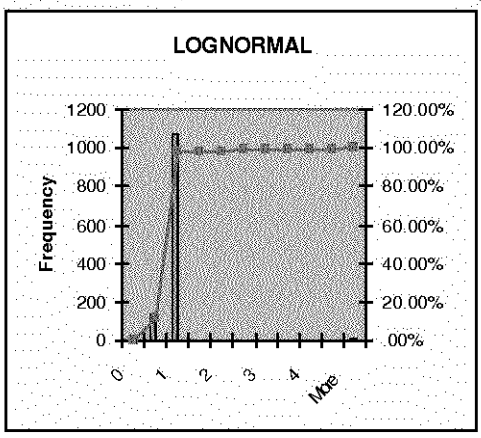
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.88**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confidence limit
n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	1	.08%
0.5	140	11.38%
1	1078	98.39%
1.5	0	98.39%
2	0	98.39%
2.5	4	98.71%
3	4	99.03%
3.5	0	99.03%
4	1	99.11%
4.5	1	99.19%
More	10	100.00%



ISOPROPYLBENZENE

Untransformed		*Log Transformed*	
Mean	6.187279843	Mean	1.528578726
Standard Error	0.569768353	Standard Error	0.013662004
Median	5	Median	1.609437912
Mode	5	Mode	1.609437912
Standard Deviation	18.21477333	Standard Deviation	0.436756979
Sample Variance	331.7779673	Sample Variance	0.190756659
Kurtosis	159.3359048	Kurtosis	41.93453308
Skewness	12.44154264	Skewness	4.593758482
Range	248.75	Range	5.298317367
Minimum	1.25	Minimum	0.223143551
Maximum	250	Maximum	5.521460918
Sum	6323.4	Sum	1562.207458
Count	1022	Count	1022
Largest(1)	250	Largest(1)	5.521460918
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.118050393	Confidence Level(95.0%)	0.026808805

Normal Distribution (95% UCL)
7.13

H = 1.743

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]
5.20

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

Histogram not run for less than 1% detection

P-ISOPROPYLTOLUENE

Untransformed		Log Transformed	
Mean	4.940487805	Mean	0.878070786
Standard Error	0.914019166	Standard Error	0.016830037
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	29.26289137	Standard Deviation	0.538824096
Sample Variance	856.3168113	Sample Variance	0.290331406
Kurtosis	200.1975195	Kurtosis	51.89687499
Skewness	13.65445628	Skewness	6.149086174
Range	478.75	Range	5.950642553
Minimum	1.25	Minimum	0.223143551
Maximum	480	Maximum	6.173786104
Sum	5064	Sum	900.0225555
Count	1025	Count	1025
Largest(1)	480	Largest(1)	6.173786104
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.793565954	Confidence Level(95.0%)	0.033025327

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1010	98.54%
20	1	98.63%
30	2	98.83%
40	1	98.93%
50	1	99.02%
60	0	99.02%
70	0	99.02%
80	1	99.12%
90	1	99.22%
100	0	99.22%
More	8	100.00%

Normal Distribution (95% UCL)

6.45

H = 1.787

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)]

2.87

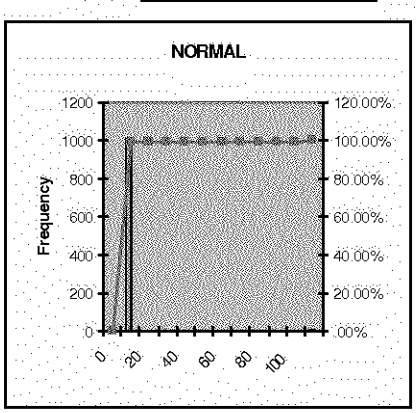
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

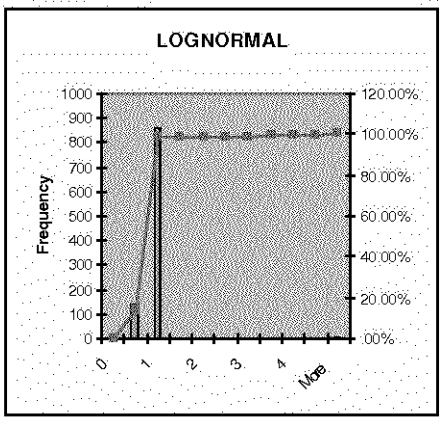
UCL = upper confiedence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	142	13.85%
1	863	98.05%
1.5	2	98.24%
2	3	98.54%
2.5	0	98.54%
3	1	98.63%
3.5	3	98.93%
4	1	99.02%
4.5	2	99.22%
More	8	100.00%



METHYLENE CHLORIDE

Untransformed		Log Transformed	
Mean	3.879907718	Mean	1.013465526
Standard Error	0.284701075	Standard Error	0.015751379
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	9.829405125	Standard Deviation	0.543821925
Sample Variance	96.61720511	Sample Variance	0.295742286
Kurtosis	134.0729341	Kurtosis	16.66409993
Skewness	11.24082259	Skewness	3.334058099
Range	123.75	Range	4.605170186
Minimum	1.25	Minimum	0.223143551
Maximum	125	Maximum	4.828313737
Sum	4624.85	Sum	1208.050907
Count	1192	Count	1192
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.558571388	Confidence Level(95.0%)	0.030903535

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1123	94.21%
20	57	98.99%
30	3	99.24%
40	0	99.24%
50	1	99.33%
60	1	99.41%
70	0	99.41%
80	0	99.41%
90	0	99.41%
100	0	99.41%
More	7	100.00%

Normal Distribution (95% UCL)

4.35

H = 1.790

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)] **3.29**

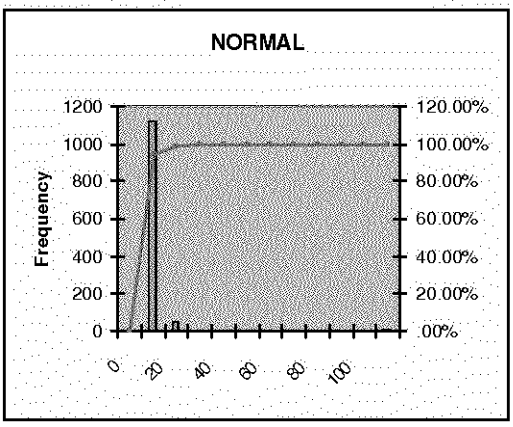
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

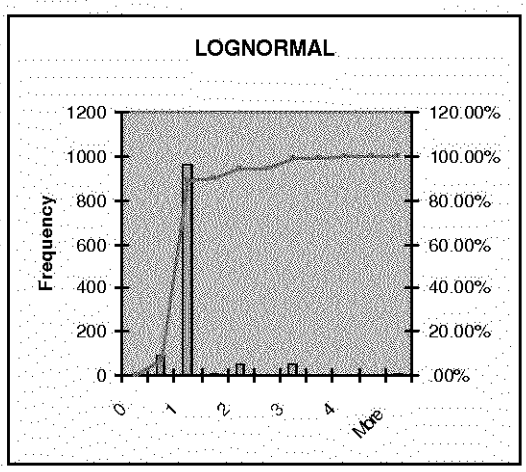
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	89	7.47%
1	966	88.51%
1.5	10	89.35%
2	57	94.13%
2.5	2	94.30%
3	56	98.99%
3.5	3	99.24%
4	2	99.41%
4.5	0	99.41%
More	7	100.00%



2-BUTANONE (MEK)

Untransformed		*Log Transformed*	
Mean	21.65827664	Mean	2.582715722
Standard Error	4.014966679	Standard Error	0.014608006
Median	12.5	Median	2.525728644
Mode	12.5	Mode	2.525728644
Standard Deviation	119.2384269	Standard Deviation	0.433835634
Sample Variance	14217.80246	Sample Variance	0.188213357
Kurtosis	544.4400693	Kurtosis	79.30452014
Skewness	21.6547562	Skewness	8.584324218
Range	3144.4	Range	6.332391134
Minimum	5.6	Minimum	1.722766598
Maximum	3150	Maximum	8.055157732
Sum	19102.6	Sum	2277.955267
Count	882	Count	882
Largest(1)	3150	Largest(1)	8.055157732
Smallest(1)	5.6	Smallest(1)	1.722766598
Confidence Level(95.0%)	7.880023663	Confidence Level(95.0%)	0.028670582

Normal Distribution (95% UCL)
28.27

Histogram not run for less than 1% detection

H = 1.744

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]
14.91

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

4-METHYL-2-PENTANONE (MIBK)

Untransformed		*Log Transformed*	
Mean	18.56575964	Mean	2.572514064
Standard Error	2.041138427	Standard Error	0.013275837
Median	12.5	Median	2.525728644
Mode	12.5	Mode	2.525728644
Standard Deviation	60.61871858	Standard Deviation	0.394272232
Sample Variance	3674.629042	Sample Variance	0.155450593
Kurtosis	114.0511447	Kurtosis	85.57914424
Skewness	10.61798816	Skewness	9.151805866
Range	827.5	Range	4.207673248
Minimum	12.5	Minimum	2.525728644
Maximum	840	Maximum	6.733401892
Sum	16375	Sum	2268.957405
Count	882	Count	882
Largest(1)	840	Largest(1)	6.733401892
Smallest(1)	12.5	Smallest(1)	2.525728644
Confidence Level(95.0%)	4.006065403	Confidence Level(95.0%)	0.026055984

Normal Distribution (95% UCL)
21.93

Histogram not run for less than 1% detection

H = 1.728

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]
14.49

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

METHYL TERT-BUTYL ETHER

Untransformed		Log Transformed	
Mean	3.361848825	Mean	0.895995417
Standard Error	0.331932241	Standard Error	0.013640169
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	10.38581981	Standard Deviation	0.426786905
Sample Variance	107.8652531	Sample Variance	0.182147062
Kurtosis	132.5034026	Kurtosis	51.59653474
Skewness	11.53016933	Skewness	5.765633388
Range	123.9	Range	4.733003557
Minimum	1.1	Minimum	0.09531018
Maximum	125	Maximum	4.828313737
Sum	3291.25	Sum	877.1795135
Count	979	Count	979
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	1.1	Smallest(1)	0.09531018
Confidence Level(95.0%)	0.651381831	Confidence Level(95.0%)	0.026767385

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	965	98.57%
20	6	99.18%
30	1	99.28%
40	0	99.28%
50	0	99.28%
60	0	99.28%
70	0	99.28%
80	0	99.28%
90	0	99.28%
100	0	99.28%
More	7	100.00%

Normal Distribution (95% UCL)

3.91

H = 1.739

Lognormal Distribution (95% UCL)

UCL = e.^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.75**

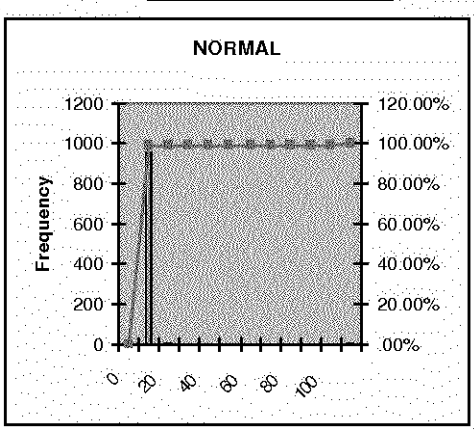
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

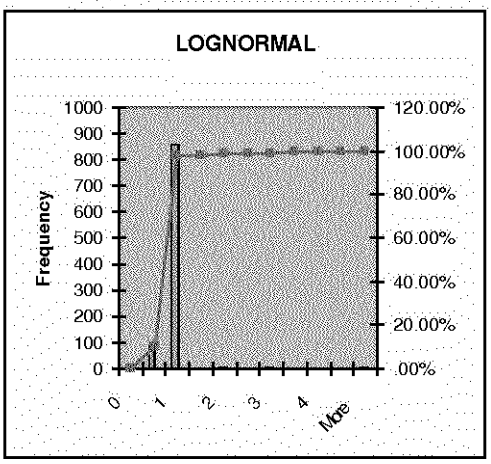
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	96	9.81%
1	859	97.55%
1.5	0	97.55%
2	9	98.47%
2.5	1	98.57%
3	6	99.18%
3.5	1	99.28%
4	0	99.28%
4.5	0	99.28%
More	7	100.00%



N-PROPYLBENZENE

Untransformed		*Log Transformed*	
Mean	3.877005871	Mean	0.870054422
Standard Error	0.521891537	Standard Error	0.015493959
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	16.68421209	Standard Deviation	0.495322258
Sample Variance	278.362933	Sample Variance	0.245344139
Kurtosis	231.0489849	Kurtosis	46.35603428
Skewness	14.12419539	Skewness	5.644331005
Range	328.75	Range	5.575949103
Minimum	1.25	Minimum	0.223143551
Maximum	330	Maximum	5.799092654
Sum	3962.3	Sum	889.1956196
Count	1022	Count	1022
Largest(1)	330	Largest(1)	5.799092654
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.024102224	Confidence Level(95.0%)	0.030403631

Normal Distribution (95% UCL)
4.74

Histogram not run for less than 1% detection

H = 1.767

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **2.77**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

TETRACHLOROETHENE

Untransformed		Log Transformed	
Mean	3.472778675	Mean	0.898387461
Standard Error	0.30447596	Standard Error	0.013226324
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	10.7130549	Standard Deviation	0.465371188
Sample Variance	114.7695454	Sample Variance	0.216570342
Kurtosis	132.0530594	Kurtosis	39.2113986
Skewness	11.33144449	Skewness	5.028254583
Range	159	Range	5.075173815
Minimum	1	Minimum	0
Maximum	160	Maximum	5.075173815
Sum	4299.3	Sum	1112.203676
Count	1238	Count	1238
Largest(1)	160	Largest(1)	5.075173815
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	0.597346716	Confidence Level(95.0%)	0.025948523

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1215	98.14%
20	10	98.95%
30	3	99.19%
40	0	99.19%
50	0	99.19%
60	1	99.27%
70	0	99.27%
80	0	99.27%
90	1	99.35%
100	0	99.35%
More	8	100.00%

Normal Distribution (95% UCL)

3.97

H = 1.755

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.80**

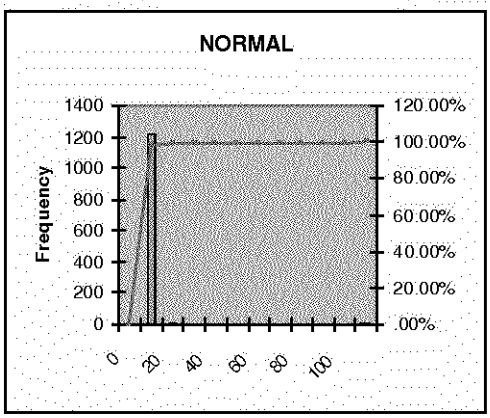
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

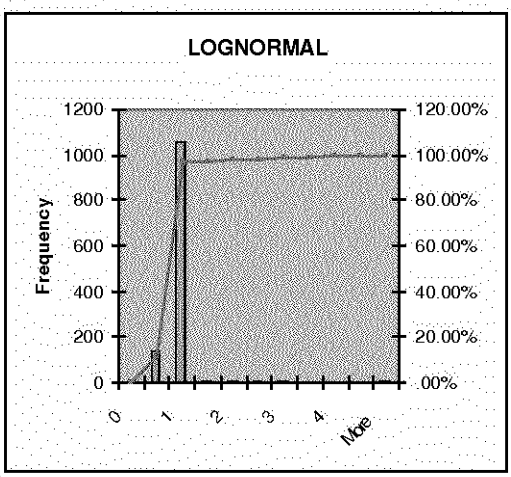
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	1	.08%
0.5	138	11.23%
1	1059	96.77%
1.5	5	97.17%
2	8	97.82%
2.5	6	98.30%
3	8	98.95%
3.5	3	99.19%
4	1	99.27%
4.5	1	99.35%
More	8	100.00%

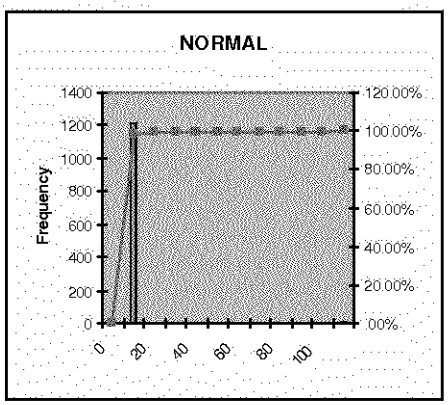


TOLUENE

Untransformed		Log Transformed	
Mean	4.246569814	Mean	0.888965
Standard Error	1.003946681	Standard Error	0.013229
Median	2.5	Median	0.916291
Mode	2.5	Mode	0.916291
Standard Deviation	35.33835274	Standard Deviation	0.465657
Sample Variance	1248.799174	Sample Variance	0.216836
Kurtosis	1061.83885	Kurtosis	58.85802
Skewness	31.57936605	Skewness	6.175939
Range	1198.75	Range	6.866933
Minimum	1.25	Minimum	0.223144
Maximum	1200	Maximum	7.090077
Sum	5261.5	Sum	1101.428
Count	1239	Count	1239
Largest(1)	1200	Largest(1)	7.090077
Smallest(1)	1.25	Smallest(1)	0.223144
Confidence Level(95.0%)	1.969623031	Confidence Level(95.0%)	0.025954

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1221	98.55%
20	6	99.03%
30	0	99.03%
40	1	99.11%
50	1	99.19%
60	1	99.27%
70	1	99.35%
80	0	99.35%
90	0	99.35%
100	0	99.35%
More	8	100.00%



Normal Distribution (95% UCL)

5.90

H = 1.755

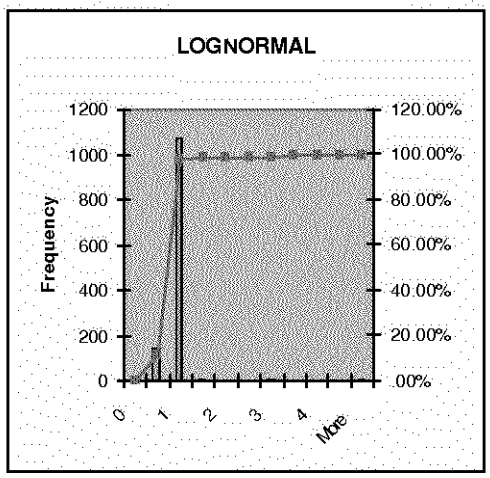
Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.77**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	138	11.14%
1	1073	97.74%
1.5	6	98.22%
2	0	98.22%
2.5	4	98.55%
3	6	99.03%
3.5	1	99.11%
4	1	99.19%
4.5	2	99.35%
More	8	100.00%



1,2,3-TRICHLOROBENZENE

Untransformed		*Log Transformed*	
Mean	3.226663405	Mean	0.857339383
Standard Error	0.317709522	Standard Error	0.013389092
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	10.15677143	Standard Deviation	0.428032322
Sample Variance	103.1600058	Sample Variance	0.183211668
Kurtosis	139.4940884	Kurtosis	50.11383979
Skewness	11.84208429	Skewness	5.387536425
Range	123.75	Range	4.605170186
Minimum	1.25	Minimum	0.223143551
Maximum	125	Maximum	4.828313737
Sum	3297.65	Sum	876.2008499
Count	1022	Count	1022
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	0.623438024	Confidence Level(95.0%)	0.026273273

Normal Distribution (95% UCL)

3.75

H = 1.739

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]

2.64

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

Histogram not run for less than 1% detections

1,2,4 TRICHLOROBENZENE

Untransformed		*Log Transformed*	
Mean	10.53880464	Mean	1.149064206
Standard Error	1.74982347	Standard Error	0.030615303
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	58.58643121	Standard Deviation	1.025041309
Sample Variance	3432.369921	Sample Variance	1.050709685
Kurtosis	577.6059979	Kurtosis	6.318727804
Skewness	22.02226575	Skewness	2.609951383
Range	1648.75	Range	7.185387016
Minimum	1.25	Minimum	0.223143551
Maximum	1650	Maximum	7.408530567
Sum	11814	Sum	1288.100974
Count	1121	Count	1121
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	3.433301951	Confidence Level(95.0%)	0.060069819

Normal Distribution (95% UCL)
13.42

Histogram not run for less than 1% detection

H = 2.088

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **5.69**

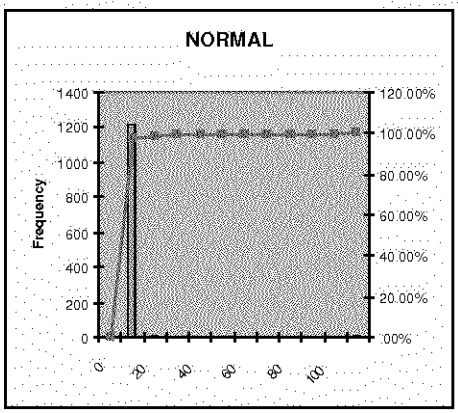
X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

1,1,1-TRICHLOROETHANE

Untransformed		Log Transformed	
Mean	5.021872478	Mean	0.908321696
Standard Error	0.971418722	Standard Error	0.01537469
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	34.19338709	Standard Deviation	0.541180362
Sample Variance	1169.18772	Sample Variance	0.292876184
Kurtosis	498.8809001	Kurtosis	47.25819131
Skewness	20.70470197	Skewness	5.87107542
Range	928.9	Range	6.739874406
Minimum	1.1	Minimum	0.09531018
Maximum	930	Maximum	6.835184586
Sum	6222.1	Sum	1125.410581
Count	1239	Count	1239
Largest(1)	930	Largest(1)	6.835184586
Smallest(1)	1.1	Smallest(1)	0.09531018
Confidence Level(95.0%)	1.905807076	Confidence Level(95.0%)	0.030163299

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1211	97.74%
20	11	98.63%
30	4	98.95%
40	1	99.03%
50	0	99.03%
60	0	99.03%
70	0	99.03%
80	0	99.03%
90	0	99.03%
100	0	99.03%
More	12	100.00%



Normal Distribution (95% UCL)

6.62

H = 1.788

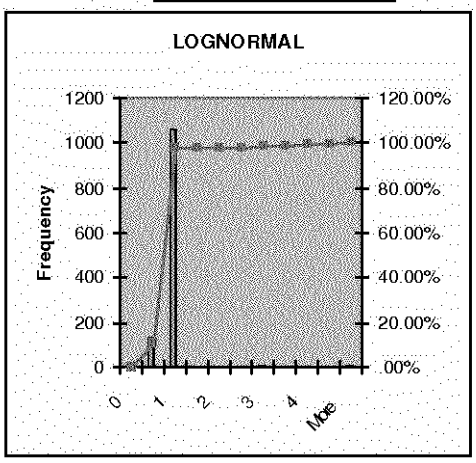
Lognormal Distribution (95% UCL)

UCL = e.^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **2.95**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	138	11.14%
1	1068	97.34%
1.5	2	97.50%
2	2	97.66%
2.5	2	97.82%
3	10	98.63%
3.5	4	98.95%
4	1	99.03%
4.5	0	99.03%
More	12	100.00%



1,1,2-TRICHLOROETHANE

Untransformed		*Log Transformed*	
Mean	3.101491539	Mean	0.863291539
Standard Error	0.261755533	Standard Error	0.01270106
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	9.221079399	Standard Deviation	0.447430788
Sample Variance	85.02830527	Sample Variance	0.20019431
Kurtosis	170.2366531	Kurtosis	107.1336605
Skewness	13.06649849	Skewness	-0.366013096
Range	124.999	Range	11.73606902
Minimum	0.001	Minimum	-6.907755279
Maximum	125	Maximum	4.828313737
Sum	3848.951	Sum	1071.3448
Count	1241	Count	1241
Largest(1)	125	Largest(1)	4.828313737
Smallest(1)	0.001	Smallest(1)	-6.907755279
Confidence Level(95.0%)	0.513532976	Confidence Level(95.0%)	0.024917957

Normal Distribution (95% UCL)
3.53

H = 1.747

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **2.68**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

Histogram not run for less than 1% detections

TRICHLOROETHENE

Untransformed		Log Transformed	
Mean	8.640355932	Mean	1.279221325
Standard Error	0.674125579	Standard Error	0.028461098
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	23.72883735	Standard Deviation	1.001814486
Sample Variance	563.0577221	Sample Variance	1.003632265
Kurtosis	69.63356246	Kurtosis	6.841475859
Skewness	7.231204998	Skewness	1.459298634
Range	339.999	Range	12.7367009
Minimum	0.001	Minimum	-6.907755279
Maximum	340	Maximum	5.828945618
Sum	10705.401	Sum	1584.955221
Count	1239	Count	1239
Largest(1)	340	Largest(1)	5.828945618
Smallest(1)	0.001	Smallest(1)	-6.907755279
Confidence Level(95.0%)	1.322553569	Confidence Level(95.0%)	0.055837263

Normal Distribution (95% UCL)

9.75

H = 2.069

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)] **6.30**

X = mean

s = standard deviation

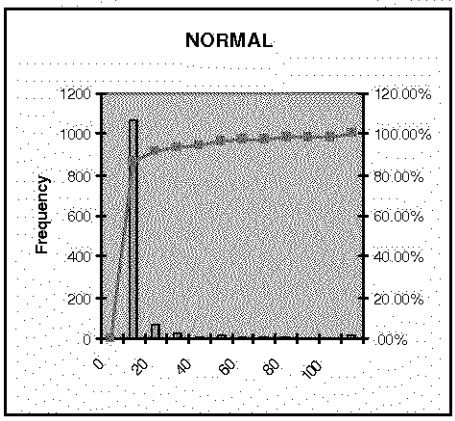
H = H-statistic (Gilbert 1987)

UCL = upper confidence limit

n = number of samples

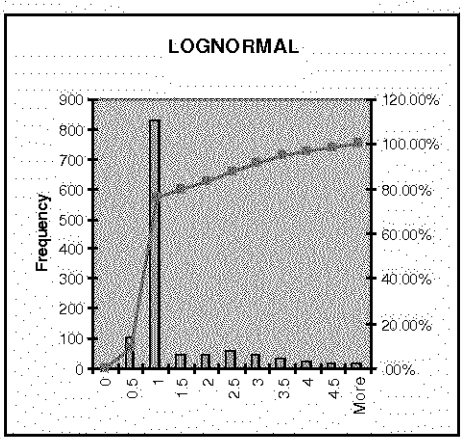
Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1071	86.44%
20	64	91.61%
30	28	93.87%
40	13	94.92%
50	19	96.45%
60	9	97.18%
70	5	97.58%
80	6	98.06%
90	2	98.22%
100	4	98.55%
More	18	100.00%



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	1	.08%
0.5	106	8.64%
1	833	75.87%
1.5	44	79.42%
2	44	82.97%
2.5	61	87.89%
3	46	91.61%
3.5	36	94.51%
4	28	96.77%
4.5	18	98.22%
More	22	100.00%

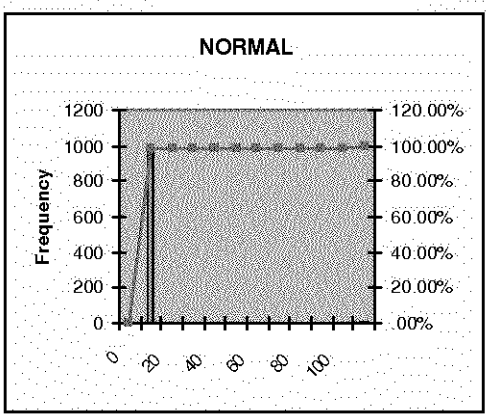


1,2,4-TRIMETHYLBENZENE

Untransformed		Log Transformed	
Mean	10.9542439	Mean	0.907716161
Standard Error	2.956522079	Standard Error	0.021291205
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	94.65489091	Standard Deviation	0.681651141
Sample Variance	8959.548373	Sample Variance	0.464648278
Kurtosis	221.212975	Kurtosis	50.58917783
Skewness	13.9782979	Skewness	6.448727963
Range	1898.75	Range	7.326465614
Minimum	1.25	Minimum	0.223143551
Maximum	1900	Maximum	7.548609165
Sum	11228.1	Sum	930.4090651
Count	1025	Count	1025
Largest(1)	1900	Largest(1)	7.548609165
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	5.801538459	Confidence Level(95.0%)	0.041779408

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1005	98.05%
20	3	98.34%
30	2	98.54%
40	0	98.54%
50	0	98.54%
60	1	98.63%
70	1	98.73%
80	0	98.73%
90	1	98.83%
100	0	98.83%
More	12	100.00%



Normal Distribution (95% UCL)

15.82

H = 1.860

Lognormal Distribution (95% UCL)

UCL = e.^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]

3.25

X = mean

s = standard deviation

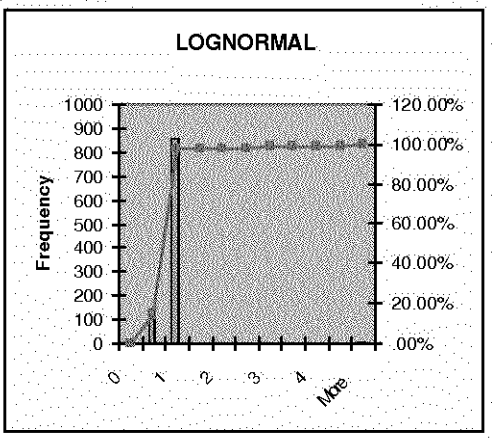
H = H-statistic (Gilbert 1987)

UCL = upper confidence limit

n = number of samples

Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	140	13.66%
1	860	97.56%
1.5	1	97.66%
2	2	97.85%
2.5	2	98.05%
3	3	98.34%
3.5	2	98.54%
4	1	98.63%
4.5	2	98.83%
More	12	100.00%



1,3,5-TRIMETHYLBENZENE

Untransformed		Log Transformed	
Mean	5.104829268	Mean	0.887045773
Standard Error	0.931232274	Standard Error	0.01760898
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	29.81397973	Standard Deviation	0.56376244
Sample Variance	888.8733873	Sample Variance	0.317828089
Kurtosis	291.5003829	Kurtosis	45.69071338
Skewness	15.43206489	Skewness	5.856643316
Range	678.75	Range	6.298949247
Minimum	1.25	Minimum	0.223143551
Maximum	680	Maximum	6.522092798
Sum	5232.45	Sum	909.2219172
Count	1025	Count	1025
Largest(1)	680	Largest(1)	6.522092798
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	1.827342975	Confidence Level(95.0%)	0.034553835

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1007	98.24%
20	3	98.54%
30	2	98.73%
40	1	98.83%
50	0	98.83%
60	0	98.83%
70	0	98.83%
80	1	98.93%
90	0	98.93%
100	1	99.02%
More	10	100.00%

Normal Distribution (95% UCL)

6.64

H = 1.799

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)]

2.94

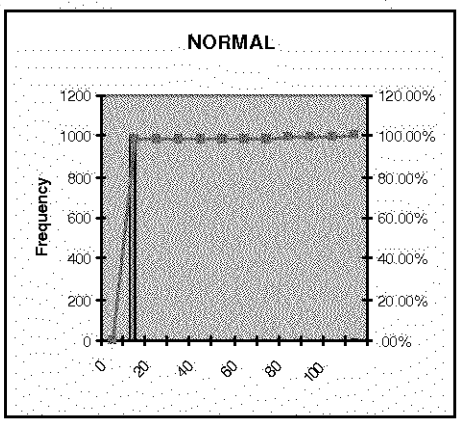
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

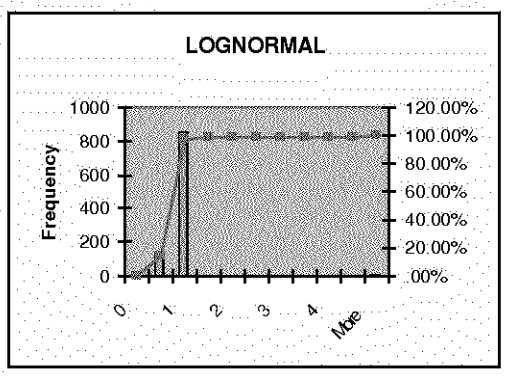
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	141	13.76%
1	861	97.76%
1.5	2	97.95%
2	1	98.05%
2.5	2	98.24%
3	3	98.54%
3.5	3	98.83%
4	0	98.83%
4.5	1	98.93%
More	11	100.00%



XYLENES

Untransformed		Log Transformed	
Mean	101.0924791	Mean	0.989751663
Standard Error	95.81459175	Standard Error	0.019060183
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	3376.699795	Standard Deviation	0.671719936
Sample Variance	11402101.5	Sample Variance	0.451206899
Kurtosis	1241.706822	Kurtosis	72.68362933
Skewness	35.23581645	Skewness	5.604599057
Range	118999.991	Range	16.39740947
Minimum	0.009	Minimum	-4.710530702
Maximum	119000	Maximum	11.68687877
Sum	125556.859	Sum	1229.271565
Count	1242	Count	1242
Largest(1)	119000	Largest(1)	11.68687877
Smallest(1)	0.009	Smallest(1)	-4.710530702
Confidence Level(95.0%)	187.9763067	Confidence Level(95.0%)	0.037393703

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	1220	98.23%
20	5	98.63%
30	1	98.71%
40	0	98.71%
50	0	98.71%
60	1	98.79%
70	0	98.79%
80	2	98.95%
90	1	99.03%
100	0	99.03%
More	12	100.00%

Normal Distribution (95% UCL)

258.81

H = 1.855

Lognormal Distribution (95% UCL)

UCL = e.^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **3.49**

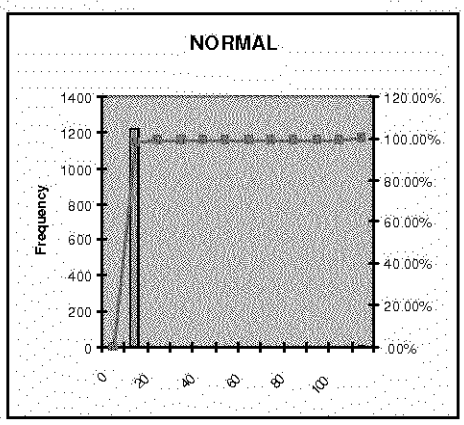
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

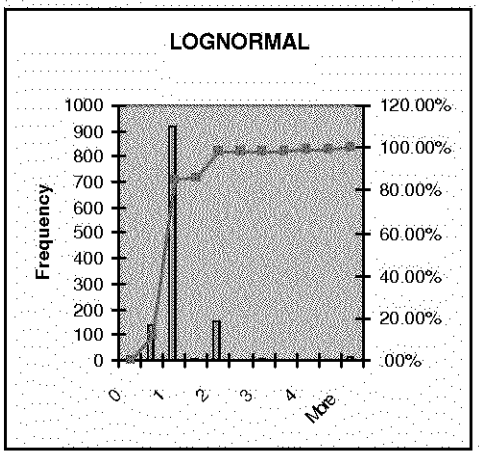
UCL = upper confidence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	1	.08%
0.5	139	11.27%
1	919	85.27%
1.5	4	85.59%
2	155	98.07%
2.5	3	98.31%
3	4	98.63%
3.5	1	98.71%
4	1	98.79%
4.5	3	99.03%
More	12	100.00%



BIS(2-ETHYLEHEXYL)PHTHALATE (BEHP)

Untransformed		Log Transformed	
Mean	110.6847222	Mean	4.230034803
Standard Error	14.74865948	Standard Error	0.049881353
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	216.7601407	Standard Deviation	0.733103172
Sample Variance	46984.9586	Sample Variance	0.537440261
Kurtosis	35.51172293	Kurtosis	5.566712386
Skewness	5.689410367	Skewness	2.231273974
Range	1631.2	Range	4.474673697
Minimum	18.8	Minimum	2.93385687
Maximum	1650	Maximum	7.408530567
Sum	23907.5	Sum	913.6875174
Count	216	Count	216
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	18.8	Smallest(1)	2.93385687
Confidence Level(95.0%)	29.0704473	Confidence Level(95.0%)	0.098318986

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	0	.00%
20	2	.93%
30	2	1.85%
40	0	1.85%
50	165	78.24%
60	0	78.24%
70	0	78.24%
80	0	78.24%
90	0	78.24%
100	0	78.24%
More	47	100.00%

Normal Distribution (95% UCL)

135.05

H = 1.938

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

99.05

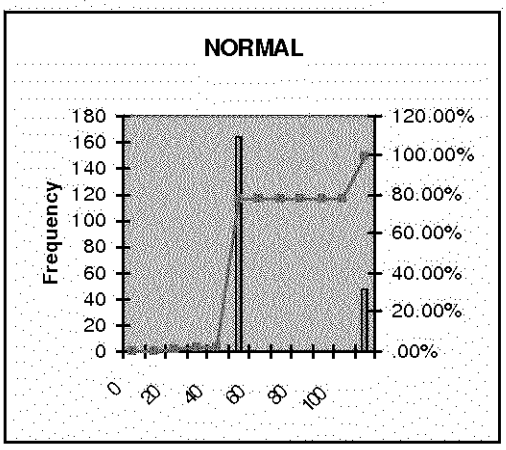
X̄ = mean

UCL = upper confiedence limit

s = standard deviation

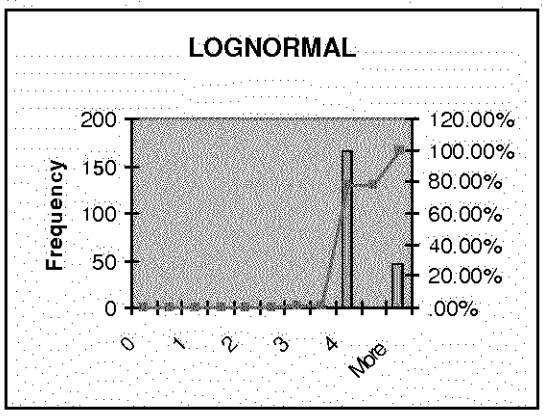
n = number of samples

H = H-statistic (Gilbert 1987)



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	0	.00%
1	0	.00%
1.5	0	.00%
2	0	.00%
2.5	0	.00%
3	2	.93%
3.5	2	1.85%
4	165	78.24%
4.5	0	78.24%
More	47	100.00%



CARBAZOLE

Untransformed		Log Transformed	
Mean	337.4468085	Mean	5.47011769
Standard Error	57.53631206	Standard Error	0.104350781
Median	165	Median	5.105945474
Mode	165	Mode	5.105945474
Standard Deviation	394.4490824	Standard Deviation	0.715392914
Sample Variance	155590.0786	Sample Variance	0.511787022
Kurtosis	6.125769413	Kurtosis	1.754076311
Skewness	2.591302302	Skewness	1.759119295
Range	1485	Range	2.302585093
Minimum	165	Minimum	5.105945474
Maximum	1650	Maximum	7.408530567
Sum	15860	Sum	257.0955314
Count	47	Count	47
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	165	Smallest(1)	5.105945474
Confidence Level(95.0%)	115.8144786	Confidence Level(95.0%)	0.210047028

Bin Range
0
50
100
150
200
250
300
350
400
450
500

Bin Range	Frequency	Cumulative %
0	0	.00%
50	0	.00%
100	0	.00%
150	0	.00%
200	36	76.60%
250	0	76.60%
300	0	76.60%
350	1	78.72%
400	0	78.72%
450	1	80.85%
500	2	85.11%
More	7	100.00%

Normal Distribution (95% UCL)

434.03

H = 2.046

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **380.64**

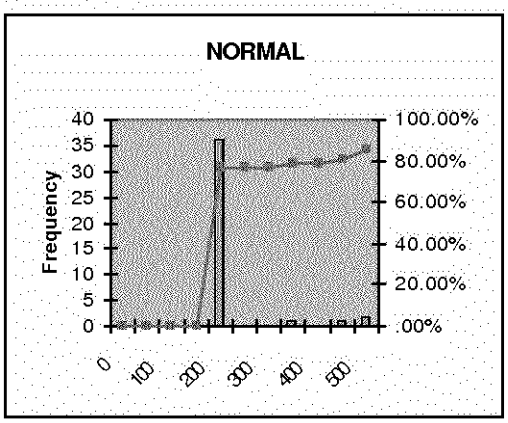
X̄ = mean

UCL = upper confiedence limit

s = standard deviation

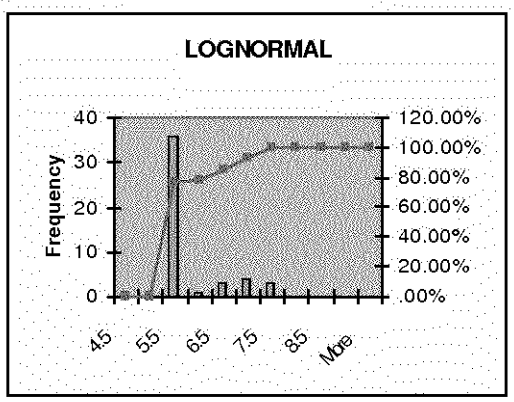
n = number of samples

H = H-statistic (Gilbert 1987)



Bin Range
4.5
5
5.5
6
6.5
7
7.5
8
8.5
9

Bin Range	Frequency	Cumulative %
4.5	0	.00%
5	0	.00%
5.5	36	76.60%
6	1	78.72%
6.5	3	85.11%
7	4	93.62%
7.5	3	100.00%
8	0	100.00%
8.5	0	100.00%
9	0	100.00%
More	0	100.00%



DIBENZOFURAN

Untransformed		*Log Transformed*	
Mean	112.5925926	Mean	4.258140254
Standard Error	14.74985084	Standard Error	0.049122037
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	216.77765	Standard Deviation	0.72194356
Sample Variance	46992.54953	Sample Variance	0.521202504
Kurtosis	35.29632398	Kurtosis	5.647830798
Skewness	5.664306947	Skewness	2.342407848
Range	1600	Range	3.496507561
Minimum	50	Minimum	3.912023005
Maximum	1650	Maximum	7.408530567
Sum	24320	Sum	919.7582949
Count	216	Count	216
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	50	Smallest(1)	3.912023005
Confidence Level(95.0%)	29.07279552	Confidence Level(95.0%)	0.096822332

Normal Distribution (95% UCL)
136.96

Histogram not run for less than 1% detections

H = **1.931**

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]
100.87

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

DI-N-BUTYL PHTHALATE

Untransformed		*Log Transformed*	
Mean	171.5740741	Mean	4.971772117
Standard Error	13.73989709	Standard Error	0.028771716
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	201.9344219	Standard Deviation	0.422856139
Sample Variance	40777.51077	Sample Variance	0.178807315
Kurtosis	40.04592496	Kurtosis	18.78964371
Skewness	6.126754649	Skewness	4.233356033
Range	1525	Range	2.58021683
Minimum	125	Minimum	4.828313737
Maximum	1650	Maximum	7.408530567
Sum	37060	Sum	1073.902777
Count	216	Count	216
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	125	Smallest(1)	4.828313737
Confidence Level(95.0%)	27.08211921	Confidence Level(95.0%)	0.05671069

Normal Distribution (95% UCL)
194.27

Histogram not run for less than 1% detections

H = **1.764**

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]
166.01

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples

1,4 DIOXANE

Untransformed		*Log Transformed*	
Mean	7.2	Mean	1.750354224
Standard Error	2.165640783	Standard Error	0.35248176
Median	8.5	Median	2.140066163
Mode	8.5	Mode	2.140066163
Standard Deviation	4.842520005	Standard Deviation	0.788173176
Sample Variance	23.45	Sample Variance	0.621216955
Kurtosis	-0.908320111	Kurtosis	-2.695024662
Skewness	0.407944571	Skewness	-0.289493953
Range	11.5	Range	1.722766598
Minimum	2.5	Minimum	0.916290732
Maximum	14	Maximum	2.63905733
Sum	36	Sum	8.75177112
Count	5	Count	5
Largest(1)	14	Largest(1)	2.63905733
Smallest(1)	2.5	Smallest(1)	0.916290732
Confidence Level(95.0%)	6.012795205	Confidence Level(95.0%)	0.978648284

Normal Distribution (95% UCL)

11.82

Histogram not run for less than 1% detections

H = 3.441

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]

30.48

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

HEXACHLOROBENZENE

Untransformed		*Log Transformed*	
Mean	111.3333333	Mean	4.248697277
Standard Error	14.73402579	Standard Error	0.048608113
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	216.5450702	Standard Deviation	0.714390444
Sample Variance	46891.76744	Sample Variance	0.510353706
Kurtosis	35.59510779	Kurtosis	6.088345296
Skewness	5.698568553	Skewness	2.421428612
Range	1600	Range	3.496507561
Minimum	50	Minimum	3.912023005
Maximum	1650	Maximum	7.408530567
Sum	24048	Sum	917.7186119
Count	216	Count	216
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	50	Smallest(1)	3.912023005
Confidence Level(95.0%)	29.04160346	Confidence Level(95.0%)	0.095809357

Normal Distribution (95% UCL)
135.67

Histogram not run for less than 1% detections

H = **1.926**

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]
99.25

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

NITROBENZENE

Untransformed		*Log Transformed*	
Mean	113.4331797	Mean	4.263915694
Standard Error	14.72367175	Standard Error	0.049314888
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	216.8932286	Standard Deviation	0.72645367
Sample Variance	47042.6726	Sample Variance	0.527734935
Kurtosis	34.95563979	Kurtosis	5.423904856
Skewness	5.625472989	Skewness	2.305458645
Range	1600	Range	3.496507561
Minimum	50	Minimum	3.912023005
Maximum	1650	Maximum	7.408530567
Sum	24615	Sum	925.2697055
Count	217	Count	217
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	50	Smallest(1)	3.912023005
Confidence Level(95.0%)	29.02045854	Confidence Level(95.0%)	0.097199985

Normal Distribution (95% UCL)
137.76

Histogram not run for less than 1% detections

H = **1.934**

Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **101.84**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

PHENOL

Untransformed		*Log Transformed*	
Mean	112.6157407	Mean	4.261121162
Standard Error	14.7341479	Standard Error	0.049005007
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	216.5468649	Standard Deviation	0.720223577
Sample Variance	46892.54468	Sample Variance	0.518722001
Kurtosis	35.45650887	Kurtosis	5.655157323
Skewness	5.680836091	Skewness	2.332460185
Range	1600	Range	3.496507561
Minimum	50	Minimum	3.912023005
Maximum	1650	Maximum	7.408530567
Sum	24325	Sum	920.4021711
Count	216	Count	216
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	50	Smallest(1)	3.912023005
Confidence Level(95.0%)	29.04184414	Confidence Level(95.0%)	0.096591659

Normal Distribution (95% UCL)

136.96

Histogram not run for less than 1% detections

H = 1.930

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

101.01

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

TETRAHYDROFURAN

Untransformed		*Log Transformed*	
Mean	14.40613718	Mean	2.343208
Standard Error	1.558142329	Standard Error	0.013614
Median	10	Median	2.302585
Mode	10	Mode	2.302585
Standard Deviation	44.91667894	Standard Deviation	0.392443
Sample Variance	2017.508047	Sample Variance	0.154012
Kurtosis	113.0358277	Kurtosis	79.95949
Skewness	10.68488106	Skewness	8.41525
Range	497.5	Range	5.298317
Minimum	2.5	Minimum	0.916291
Maximum	500	Maximum	6.214608
Sum	11971.5	Sum	1947.206
Count	831	Count	831
Largest(1)	500	Largest(1)	6.214608
Smallest(1)	2.5	Smallest(1)	0.916291
Confidence Level(95.0%)	3.05836226	Confidence Level(95.0%)	0.026721

Normal Distribution (95% UCL)

16.97

Histogram not run for less than 1% detections

H = 1.728

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **11.52**

X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

4,4 - DDD

Untransformed		Log Transformed	
Mean	2.893617021	Mean	0.095740631
Standard Error	1.893617021	Standard Error	0.095740631
Median	1	Median	0
Mode	1	Mode	0
Standard Deviation	12.98198424	Standard Deviation	0.656364699
Sample Variance	168.5319149	Sample Variance	0.430814618
Kurtosis	47	Kurtosis	47
Skewness	6.8556546	Skewness	6.8556546
Range	89	Range	4.49980967
Minimum	1	Minimum	0
Maximum	90	Maximum	4.49980967
Sum	136	Sum	4.49980967
Count	47	Count	47
Largest(1)	90	Largest(1)	4.49980967
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	3.811649723	Confidence Level(95.0%)	0.192715711

Bin Range
0
10
20
30
40
50
60
70
80
90
100

C	Frequency	Cumulative %
10	46	97.87%
20	0	97.87%
30	0	97.87%
40	0	97.87%
50	0	97.87%
60	0	97.87%
70	0	97.87%
80	0	97.87%
90	1	100.00%
100	0	100.00%
More	0	100.00%

Normal Distribution (95% UCL)

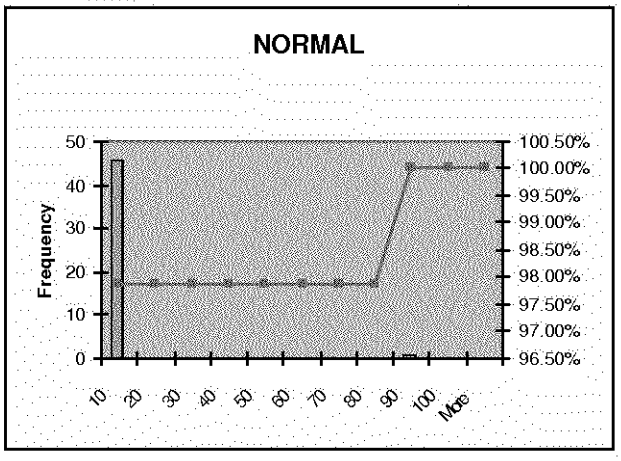
6.07

H =	1.998

Lognormal Distribution (95% UCL)

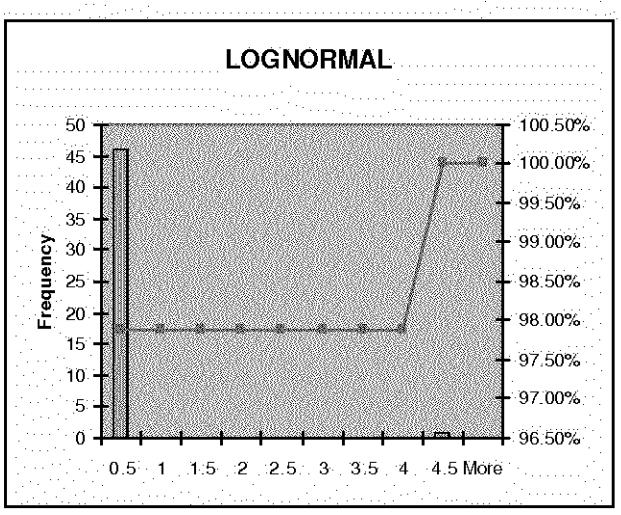
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **1.66**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

C	Frequency	Cumulative %
0.5	46	97.87%
1	0	97.87%
1.5	0	97.87%
2	0	97.87%
2.5	0	97.87%
3	0	97.87%
3.5	0	97.87%
4	0	97.87%
4.5	1	100.00%
More	0	100.00%



4,4 - DDE

Untransformed		Log Transformed	
Mean	4.957446809	Mean	0.794899588
Standard Error	2.720091323	Standard Error	0.118699175
Median	2.5	Median	0.916290732
Mode	2.5	Mode	0.916290732
Standard Deviation	18.64800659	Standard Deviation	0.813760544
Sample Variance	347.7481499	Sample Variance	0.662206222
Kurtosis	46.86935328	Kurtosis	13.99540923
Skewness	6.841538828	Skewness	2.016218101
Range	129.5	Range	5.560681631
Minimum	0.5	Minimum	-0.693147181
Maximum	130	Maximum	4.86753445
Sum	233	Sum	37.36028064
Count	47	Count	47
Largest(1)	130	Largest(1)	4.86753445
Smallest(1)	0.5	Smallest(1)	-0.693147181
Confidence Level(95.0%)	5.475254617	Confidence Level(95.0%)	0.238928818

Bin Range
0
10
20
30
40
50
60
70
80
90
100

C	Frequency	Cumulative %
10	46	97.87%
20	0	97.87%
30	0	97.87%
40	0	97.87%
50	0	97.87%
60	0	97.87%
70	0	97.87%
80	0	97.87%
90	0	97.87%
100	0	97.87%
More	1	100.00%

Normal Distribution (95% UCL)

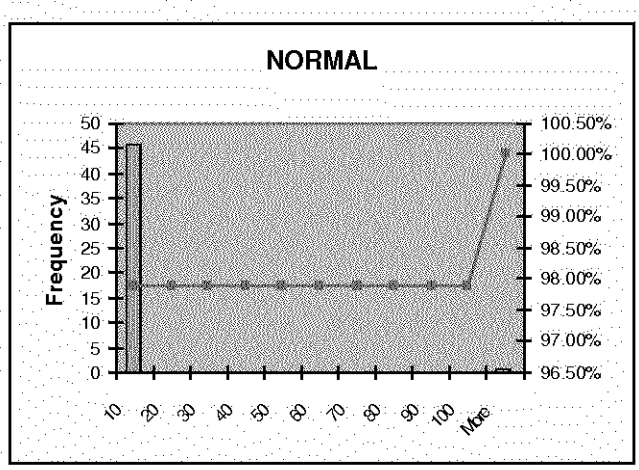
9.52

H = 2.134

Lognormal Distribution (95% UCL)

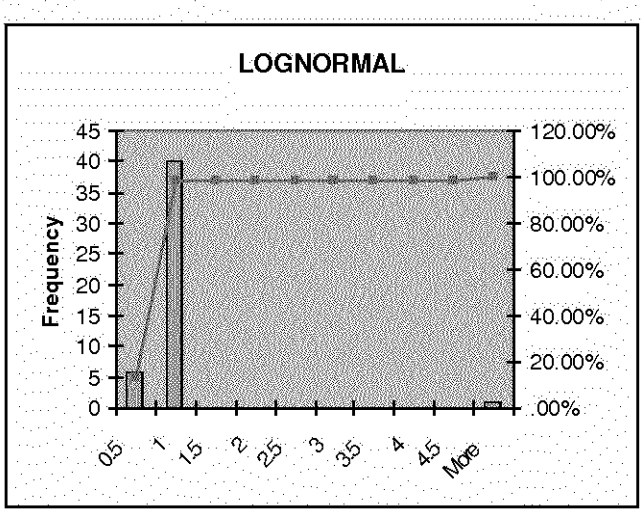
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **3.98**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

C	Frequency	Cumulative %
0.5	6	12.77%
1	40	97.87%
1.5	0	97.87%
2	0	97.87%
2.5	0	97.87%
3	0	97.87%
3.5	0	97.87%
4	0	97.87%
4.5	0	97.87%
More	1	100.00%



4,4-DDT

Untransformed		Log Transformed	
Mean	2.117021277	Mean	-0.439598472
Standard Error	1.378959505	Standard Error	0.121485509
Median	0.5	Median	-0.693147181
Mode	0.5	Mode	-0.693147181
Standard Deviation	9.453670075	Standard Deviation	0.832862691
Sample Variance	89.37187789	Sample Variance	0.693660263
Kurtosis	45.29114639	Kurtosis	22.63300319
Skewness	6.686399803	Skewness	4.576008566
Range	64.5	Range	4.86753445
Minimum	0.5	Minimum	-0.693147181
Maximum	65	Maximum	4.17438727
Sum	99.5	Sum	-20.66112819
Count	47	Count	47
Largest(1)	65	Largest(1)	4.17438727
Smallest(1)	0.5	Smallest(1)	-0.693147181
Confidence Level(95.0%)	2.775698865	Confidence Level(95.0%)	0.244537413

Bin Range
0
10
20
30
40
50
60
70
80
90
100

C	Frequency	Cumulative %
10	46	97.87%
20	0	97.87%
30	0	97.87%
40	0	97.87%
50	0	97.87%
60	0	97.87%
70	1	100.00%
80	0	100.00%
90	0	100.00%
100	0	100.00%
More	0	100.00%

Normal Distribution (95% UCL)

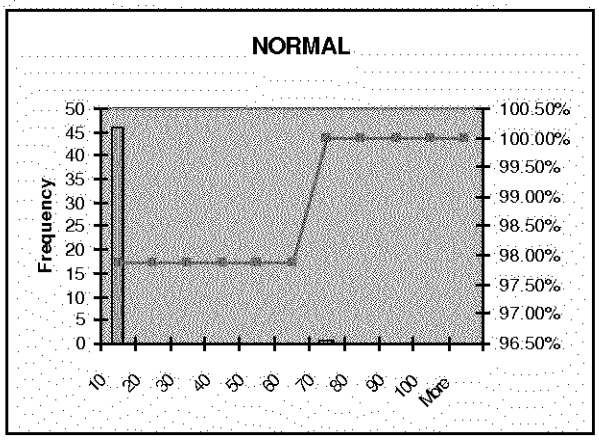
4.43

H = 2.152

Lognormal Distribution (95% UCL)

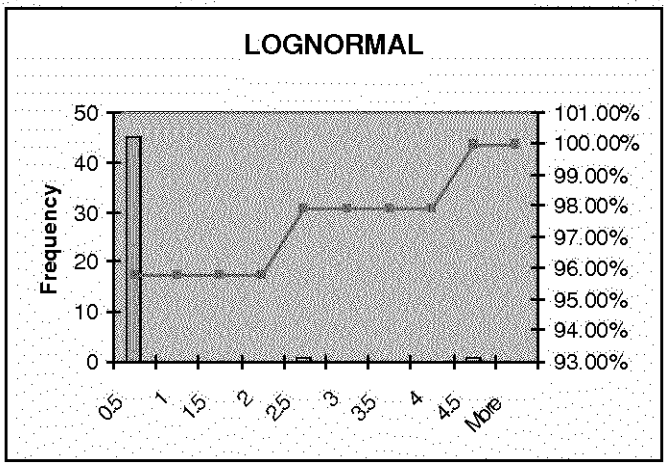
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **1.19**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

C	Frequency	Cumulative %
0.5	45	95.74%
1	0	95.74%
1.5	0	95.74%
2	0	95.74%
2.5	1	97.87%
3	0	97.87%
3.5	0	97.87%
4	0	97.87%
4.5	1	100.00%
More	0	100.00%



AROCLOR-1248

Untransformed		Log Transformed	
Mean	16.11507937	Mean	2.608485846
Standard Error	1.576153271	Standard Error	0.040784191
Median	10	Median	2.302585093
Mode	10	Mode	2.302585093
Standard Deviation	17.69227659	Standard Deviation	0.457801414
Sample Variance	313.0166509	Sample Variance	0.209582134
Kurtosis	47.15875628	Kurtosis	10.66659752
Skewness	6.459842598	Skewness	2.742735667
Range	155	Range	2.803360381
Minimum	10	Minimum	2.302585093
Maximum	165	Maximum	5.105945474
Sum	2030.5	Sum	328.6592165
Count	126	Count	126
Largest(1)	165	Largest(1)	5.105945474
Smallest(1)	10	Smallest(1)	2.302585093
Confidence Level(95.0%)	3.119402998	Confidence Level(95.0%)	0.080716978

Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	68	53.97%
20	48	92.06%
30	4	95.24%
40	2	96.83%
50	1	97.62%
60	0	97.62%
70	0	97.62%
80	1	98.41%
90	0	98.41%
100	0	98.41%
More	2	100.00%

Normal Distribution (95% UCL)

18.73

H = 1.796

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]

16.23

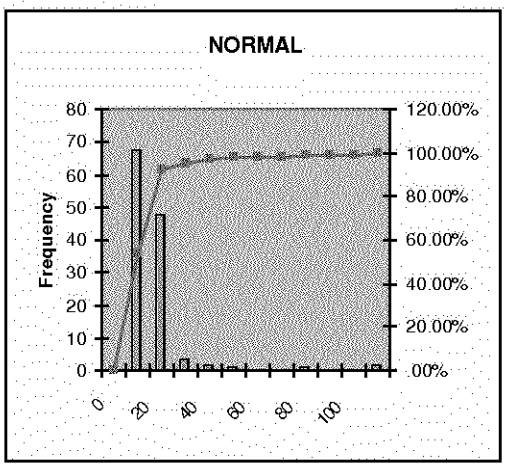
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

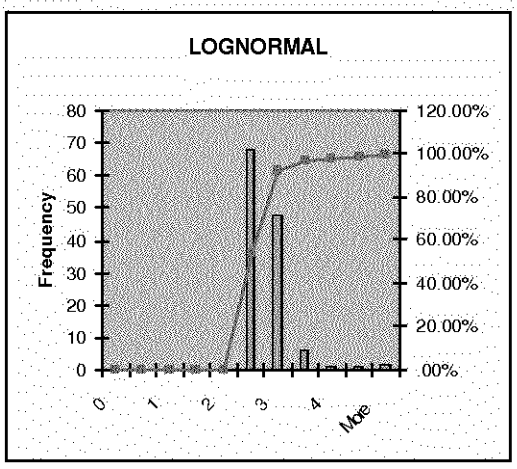
UCL = upper confiedence limit

n = number of samples



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	0	.00%
1	0	.00%
1.5	0	.00%
2	0	.00%
2.5	68	53.97%
3	48	92.06%
3.5	6	96.83%
4	1	97.62%
4.5	1	98.41%
More	2	100.00%



AROCLOR-1254

Untransformed		Log Transformed	
Mean	17.3531746	Mean	2.616970769
Standard Error	2.259534068	Standard Error	0.044693111
Median	10	Median	2.302585093
Mode	10	Mode	2.302585093
Standard Deviation	25.36320701	Standard Deviation	0.501678926
Sample Variance	643.2922698	Sample Variance	0.251681745
Kurtosis	48.92029221	Kurtosis	13.60092718
Skewness	6.697184863	Skewness	3.206334406
Range	220	Range	3.135494216
Minimum	10	Minimum	2.302585093
Maximum	230	Maximum	5.438079309
Sum	2186.5	Sum	329.7383169
Count	126	Count	126
Largest(1)	230	Largest(1)	5.438079309
Smallest(1)	10	Smallest(1)	2.302585093
Confidence Level(95.0%)	4.47189841	Confidence Level(95.0%)	0.088453215

Normal Distribution (95% UCL)
21.10

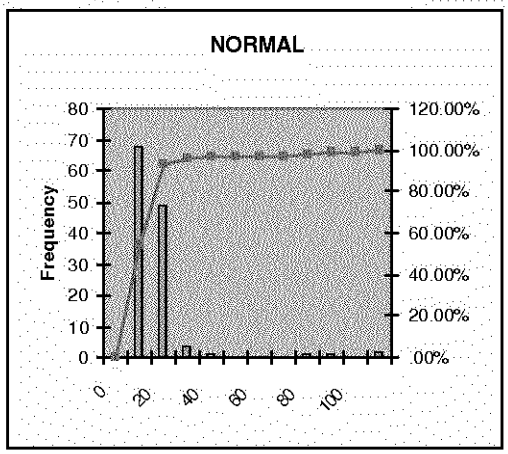
H = 1.821

Lognormal Distribution (95% UCL)
UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **16.85**

X̄ = mean
UCL = upper confiedence limit
s = standard deviation
n = number of samples
H = H-statistic (Gilbert 1987)

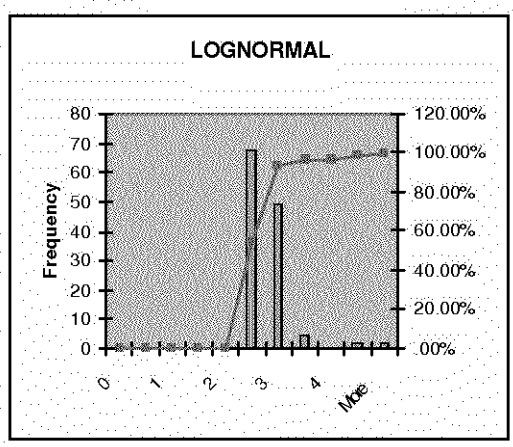
Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	68	53.97%
20	49	92.86%
30	4	96.03%
40	1	96.83%
50	0	96.83%
60	0	96.83%
70	0	96.83%
80	1	97.62%
90	1	98.41%
100	0	98.41%
More	2	100.00%



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	0	.00%
1	0	.00%
1.5	0	.00%
2	0	.00%
2.5	68	53.97%
3	49	92.86%
3.5	5	96.83%
4	0	96.83%
4.5	2	98.41%
More	2	100.00%



AROCLOR-1260

Untransformed		Log Transformed	
Mean	42.068	Mean	2.856460087
Standard Error	10.50534786	Standard Error	0.085350295
Median	10	Median	2.302585093
Mode	10	Mode	2.302585093
Standard Deviation	117.4533597	Standard Deviation	0.954245307
Sample Variance	13795.29171	Sample Variance	0.910584106
Kurtosis	38.27200364	Kurtosis	5.094799108
Skewness	5.896824082	Skewness	2.306667042
Range	920	Range	4.532599493
Minimum	10	Minimum	2.302585093
Maximum	930	Maximum	6.835184586
Sum	5258.5	Sum	357.0575108
Count	125	Count	125
Largest(1)	930	Largest(1)	6.835184586
Smallest(1)	10	Smallest(1)	2.302585093
Confidence Level(95.0%)	20.79301179	Confidence Level(95.0%)	0.168932025

Normal Distribution (95% UCL)

59.48

H = 2.143

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1)$^{0.5}$)]

32.96

X = mean

s = standard deviation

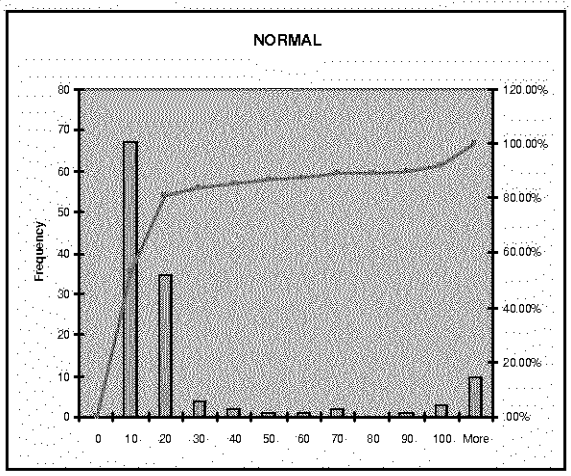
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

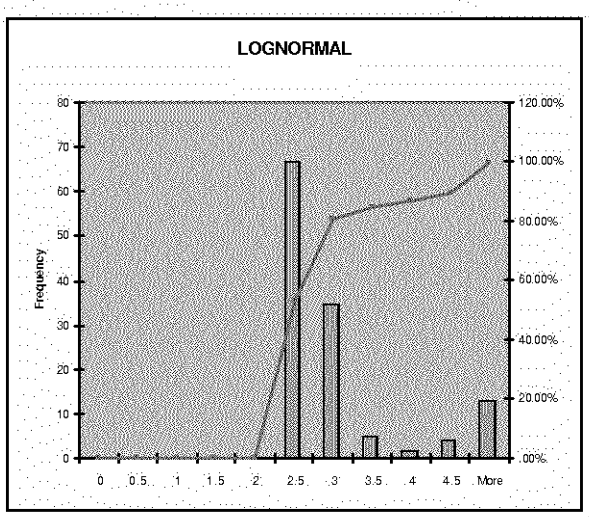
Bin Range
0
10
20
30
40
50
60
70
80
90
100

Bin Range	Frequency	Cumulative %
0	0	.00%
10	67	53.17%
20	35	80.95%
30	4	84.13%
40	2	85.71%
50	1	86.51%
60	1	87.30%
70	2	88.89%
80	0	88.89%
90	1	89.68%
100	3	92.06%
More	10	100.00%



Bin Range
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5

Bin Range	Frequency	Cumulative %
0	0	.00%
0.5	0	.00%
1	0	.00%
1.5	0	.00%
2	0	.00%
2.5	67	53.17%
3	35	80.95%
3.5	5	84.92%
4	2	86.51%
4.5	4	89.68%
More	13	100.00%



ACENAPTHENE

Untransformed		Log Transformed	
Mean	182.6720648	Mean	4.374636167
Standard Error	25.83221799	Standard Error	0.063591255
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	405.9851735	Standard Deviation	0.999415022
Sample Variance	164823.9611	Sample Variance	0.998830386
Kurtosis	18.01416171	Kurtosis	2.924878933
Skewness	4.109216188	Skewness	1.829782355
Range	2988	Range	5.521460918
Minimum	12	Minimum	2.484906665
Maximum	3000	Maximum	8.006367568
Sum	45120	Sum	1080.535133
Count	247	Count	247
Largest(1)	3000	Largest(1)	8.006367568
Smallest(1)	12	Smallest(1)	2.484906665
Confidence Level(95.0%)	50.88059083	Confidence Level(95.0%)	0.125252916

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	180	72.87%
100	2	73.68%
150	4	75.30%
200	33	88.66%
250	5	90.69%
300	0	90.69%
350	1	91.09%
400	0	91.09%
450	0	91.09%
500	4	92.71%
1000	7	95.55%
More	11	100.00%

Normal Distribution (95% UCL)

225.32

H = 2.126

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **149.86**

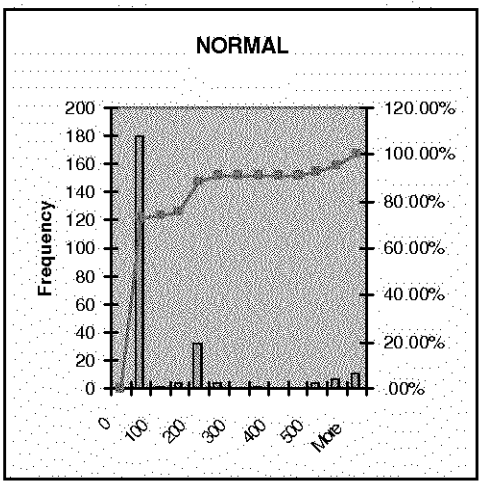
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

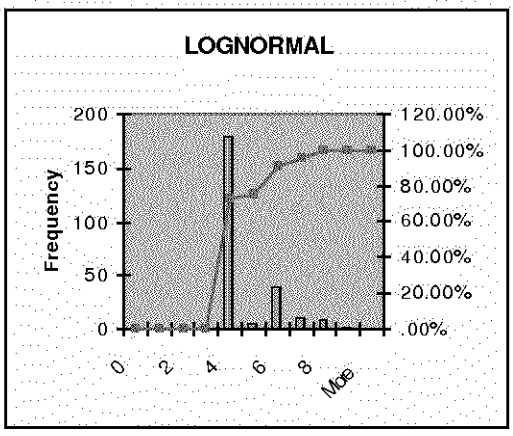
UCL = upper confiedence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	0	.00%
2	0	.00%
3	1	.40%
4	179	72.87%
5	6	75.30%
6	39	91.09%
7	11	95.55%
8	10	99.60%
9	1	100.00%
More	0	100.00%



ACENAPTHYLENE

Untransformed		Log Transformed	
Mean	198.6032389	Mean	4.393817972
Standard Error	42.22024411	Standard Error	0.060811826
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	663.543221	Standard Deviation	0.955732874
Sample Variance	440289.6062	Sample Variance	0.913425326
Kurtosis	139.0365307	Kurtosis	4.821806561
Skewness	10.66482486	Skewness	2.239855402
Range	9175	Range	5.908082938
Minimum	25	Minimum	3.218875825
Maximum	9200	Maximum	9.126958763
Sum	49055	Sum	1085.273039
Count	247	Count	247
Largest(1)	9200	Largest(1)	9.126958763
Smallest(1)	25	Smallest(1)	3.218875825
Confidence Level(95.0%)	83.15936963	Confidence Level(95.0%)	0.119778397

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	171	69.23%
100	29	80.97%
150	1	81.38%
200	20	89.47%
250	2	90.28%
300	0	90.28%
350	1	90.69%
400	0	90.69%
450	0	90.69%
500	5	92.71%
1000	8	95.95%
More	10	100.00%

Normal Distribution (95% UCL)

268.31

H = 2.094

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

145.20

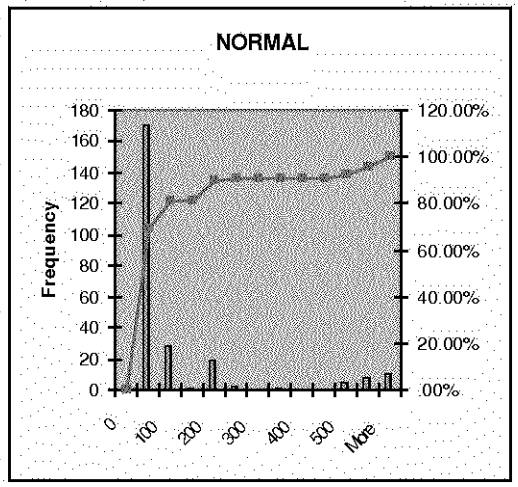
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

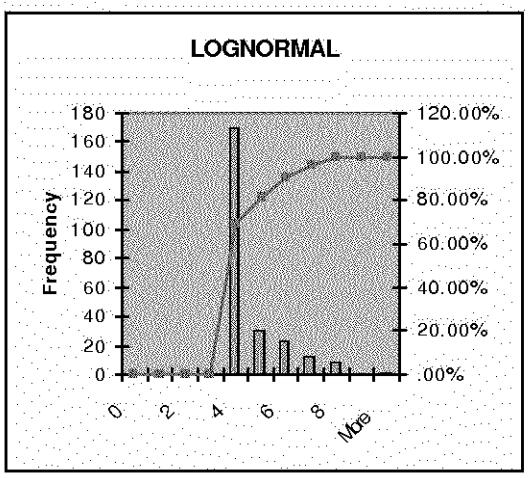
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	0	.00%
2	0	.00%
3	0	.00%
4	171	69.23%
5	30	81.38%
6	23	90.69%
7	13	95.95%
8	9	99.60%
9	0	99.60%
More	1	100.00%



ANTHRACENE

Untransformed		Log Transformed	
Mean	86.58380567	Mean	3.696055971
Standard Error	12.95799854	Standard Error	0.083242673
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	203.6509326	Standard Deviation	1.30826129
Sample Variance	41473.70234	Sample Variance	1.711547604
Kurtosis	45.40712577	Kurtosis	2.470192553
Skewness	6.546476199	Skewness	-1.005826064
Range	1699	Range	7.43838353
Minimum	1	Minimum	0
Maximum	1700	Maximum	7.43838353
Sum	21410.9	Sum	912.9258249
Count	247	Count	247
Largest(1)	1700	Largest(1)	7.43838353
Smallest(1)	1	Smallest(1)	0
Confidence Level(95.0%)	25.52280344	Confidence Level(95.0%)	0.163959454

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

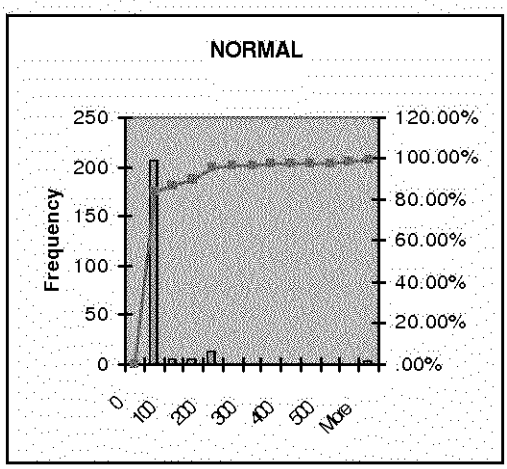
Bin Range	Frequency	Cumulative %
0	0	.00%
50	208	84.21%
100	7	87.04%
150	7	89.88%
200	15	95.95%
250	1	96.36%
300	1	96.76%
350	1	97.17%
400	1	97.57%
450	0	97.57%
500	1	97.98%
1000	1	98.38%
More	4	100.00%

Normal Distribution (95% UCL)
108.08

H = 2401

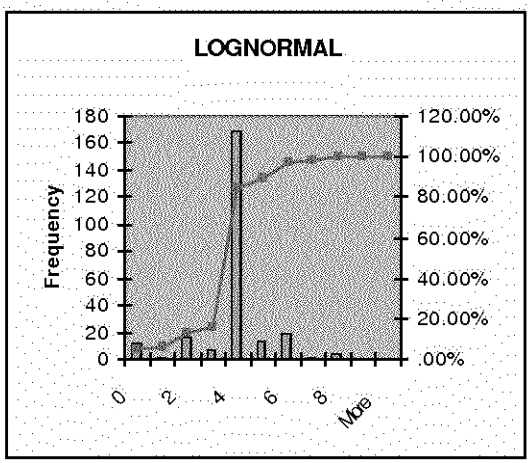
Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **115.83**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confiedence limit
n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	12	4.86%
1	2	5.67%
2	17	12.55%
3	7	15.38%
4	170	84.21%
5	13	89.47%
6	20	97.57%
7	2	98.38%
8	4	100.00%
9	0	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Anthracene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 241
Sample Standard Deviation = 206.106
D'Agostino Statistic (D) = 0.117307
Significance Statistic (Y) = -85.3129

5% Critical value of -1.926 and 1.328 do not contain -85.3129
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -85.3129
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Anthracene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 241
Sample Standard Deviation = 1.32253
D'Agostino Statistic (D) = 0.2224
Significance Statistic (Y) = -30.9046

5% Critical value of -1.926 and 1.328 do not contain -30.9046
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -30.9046
Evidence of non-normality at 99% level of significance

BENZO(A)ANTHRACENE

Untransformed		Log Transformed	
Mean	104.0797166	Mean	3.822642507
Standard Error	23.51806233	Standard Error	0.074725038
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	369.6153624	Standard Deviation	1.174395155
Sample Variance	136615.5161	Sample Variance	1.379206328
Kurtosis	123.718223	Kurtosis	4.835724992
Skewness	10.44352873	Skewness	-0.820742832
Range	4899.61	Range	9.438599024
Minimum	0.39	Minimum	-0.94160854
Maximum	4900	Maximum	8.496990484
Sum	25707.69	Sum	944.1926993
Count	247	Count	247
Largest(1)	4900	Largest(1)	8.496990484
Smallest(1)	0.39	Smallest(1)	-0.94160854
Confidence Level(95.0%)	46.32249953	Confidence Level(95.0%)	0.147182641

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	203	82.19%
100	8	85.43%
150	15	91.50%
200	9	95.14%
250	2	95.95%
300	3	97.17%
350	0	97.17%
400	2	97.98%
450	0	97.98%
500	0	97.98%
1000	1	98.38%
More	4	100.00%

Normal Distribution (95% UCL)

142.91

H = 2.280

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **108.09**

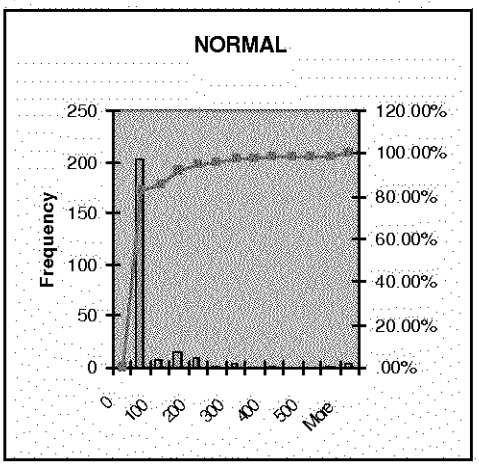
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

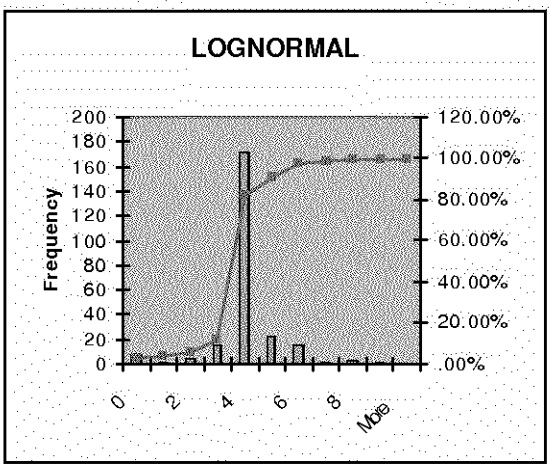
UCL = upper confiedence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	8	3.24%
1	1	3.64%
2	5	5.67%
3	16	12.15%
4	173	82.19%
5	22	91.09%
6	17	97.98%
7	1	98.38%
8	3	99.60%
9	1	100.00%
More	0	100.00%



D'Agostino Analysis

Parameter: benzo(a)anthracene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 507.944
D'Agostino Statistic (D) = 0.133593
Significance Statistic (Y) = -81.9765

5% Critical value of -1.906 and 1.357 do not contain -81.9765
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -81.9765
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: benzo(a)anthracene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 1.23566
D'Agostino Statistic (D) = 0.230131
Significance Statistic (Y) = -28.6852

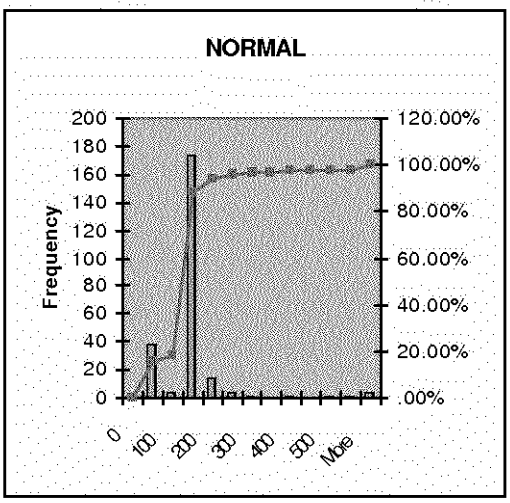
5% Critical value of -1.906 and 1.357 do not contain -28.6852
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -28.6852
Evidence of non-normality at 99% level of significance

BENZO(B)FLUORANTHENE

Untransformed		Log Transformed	
Mean	174.3639271	Mean	4.416459288
Standard Error	32.16793584	Standard Error	0.089172744
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	505.5587956	Standard Deviation	1.401459672
Sample Variance	255589.6958	Sample Variance	1.964089212
Kurtosis	140.2842563	Kurtosis	3.058382368
Skewness	11.09059123	Skewness	1.559208382
Range	6999.51	Range	9.567015316
Minimum	0.49	Minimum	-0.713349888
Maximum	7000	Maximum	8.853665428
Sum	43067.89	Sum	1090.865444
Count	247	Count	247
Largest(1)	7000	Largest(1)	8.853665428
Smallest(1)	0.49	Smallest(1)	-0.713349888
Confidence Level(95.0%)	63.35977736	Confidence Level(95.0%)	0.175639656

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	39	15.79%
100	5	17.81%
150	174	88.26%
200	15	94.33%
250	4	95.95%
300	2	96.76%
350	0	96.76%
400	1	97.17%
450	0	97.17%
500	1	97.57%
1000	1	97.98%
More	5	100.00%



Normal Distribution (95% UCL)
227.48

H = 2.491

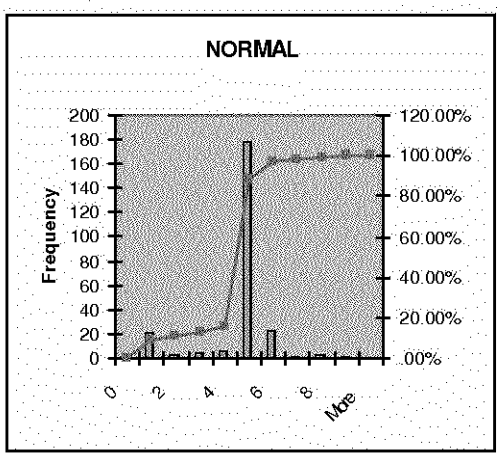
Lognormal Distribution (95% UCL)
UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **276.18**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit
n = number of samples

Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	1	.40%
1	22	9.31%
2	4	10.93%
3	5	12.96%
4	7	15.79%
5	178	87.85%
6	23	97.17%
7	2	97.98%
8	3	99.19%
9	2	100.00%
More	0	100.00%



D'Agostino Analysis

Parameter: benzo(b)fluoranthene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 653.552
D'Agostino Statistic (D) = 0.124768
Significance Statistic (Y) = -86.8482

5% Critical value of -1.906 and 1.357 do not contain -86.8482
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -86.8482
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: benzo(b)fluoranthene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 1.35591
D'Agostino Statistic (D) = 0.209202
Significance Statistic (Y) = -40.2383

5% Critical value of -1.906 and 1.357 do not contain -40.2383
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -40.2383
Evidence of non-normality at 99% level of significance

BENZO(K)FLUORANTHENE

Untransformed		Log Transformed	
Mean	132.5362753	Mean	4.233796737
Standard Error	17.37170544	Standard Error	0.094981165
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	273.0177815	Standard Deviation	1.492746177
Sample Variance	74538.70899	Sample Variance	2.228291149
Kurtosis	139.3856298	Kurtosis	2.59889267
Skewness	11.10509411	Skewness	-1.738777864
Range	3799.74	Range	9.589829994
Minimum	0.26	Minimum	-1.347073648
Maximum	3800	Maximum	8.242756346
Sum	32736.46	Sum	1045.747794
Count	247	Count	247
Largest(1)	3800	Largest(1)	8.242756346
Smallest(1)	0.26	Smallest(1)	-1.347073648
Confidence Level(95.0%)	34.21628898	Confidence Level(95.0%)	0.187080249

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	49	19.84%
100	8	23.08%
150	168	91.09%
200	15	97.17%
250	2	97.98%
300	1	98.38%
350	0	98.38%
400	0	98.38%
450	0	98.38%
500	1	98.79%
1000	0	98.79%
More	3	100.00%

Normal Distribution (95% UCL)

161.22

H = 2.579

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **268.63**

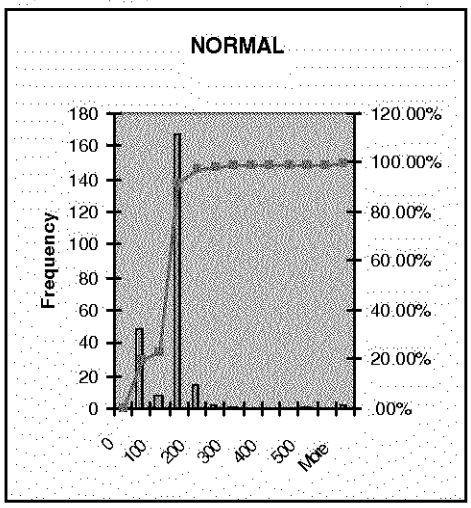
X̄ = mean

UCL = upper confiedence limit

s = standard deviation

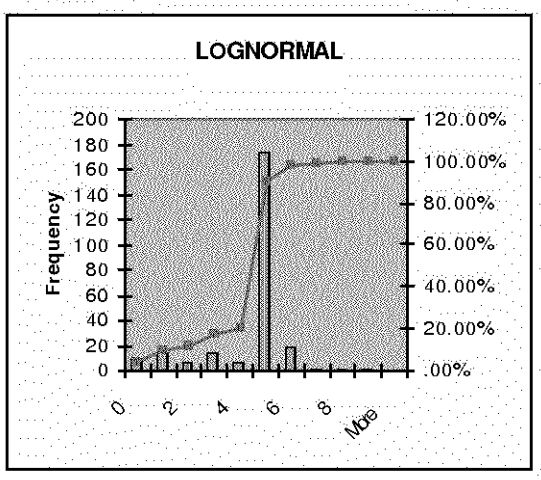
n = number of samples

H = H-statistic (Gilbert 1987)



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	9	3.64%
1	14	9.31%
2	6	11.74%
3	14	17.41%
4	7	20.24%
5	174	90.69%
6	19	98.38%
7	1	98.79%
8	2	99.60%
9	1	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: benzo(k)fluoranthene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 274
Sample Standard Deviation = 449.633
D'Agostino Statistic (D) = 0.142243
Significance Statistic (Y) = -77.2016

5% Critical value of -1.906 and 1.357 do not contain -77.2016
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -77.2016
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: benzo(k)fluoranthene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 274
Sample Standard Deviation = 1.46808
D'Agostino Statistic (D) = 0.212749
Significance Statistic (Y) = -38.2804

5% Critical value of -1.906 and 1.357 do not contain -38.2804
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -38.2804
Evidence of non-normality at 99% level of significance

BENZO(G,H,I)PERYLENE

Untransformed		Log Transformed	
Mean	138.8748583	Mean	4.450192268
Standard Error	15.31842766	Standard Error	0.075628335
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	240.7479882	Standard Deviation	1.188592576
Sample Variance	57959.5938	Sample Variance	1.412752312
Kurtosis	108.2797086	Kurtosis	4.210704513
Skewness	9.784726 3	Skewness	-1.803277643
Range	3099.71	Range	9.277031746
Minimum	0.29	Minimum	-1.237874356
Maximum	3100	Maximum	8.039157399
Sum	34302.09	Sum	1099.19749
Count	247	Count	247
Largest(1)	3100	Largest(1)	8.039157399
Smallest(1)	0.29	Smallest(1)	-1.237874356
Confidence Level(95.0%)	30.17203748	Confidence Level(95.0%)	0.148961825

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	39	15.79%
100	9	19.43%
150	172	89.07%
200	14	94.74%
250	5	96.76%
300	1	97.17%
350	1	97.57%
400	1	97.98%
450	1	98.38%
500	1	98.79%
1000	0	98.79%
More	3	100.00%

Normal Distribution (95% UCL)

164.17

H = 2.29

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **206.49**

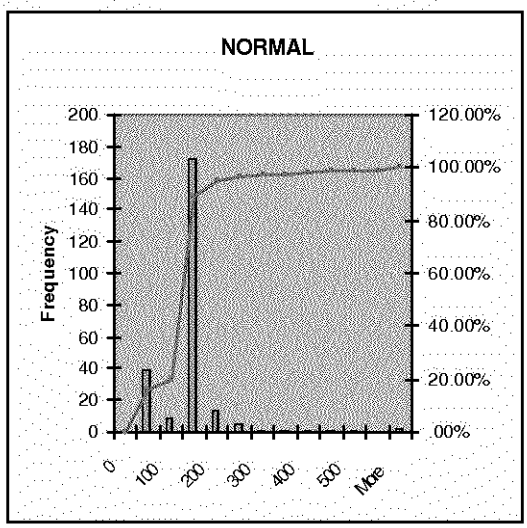
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

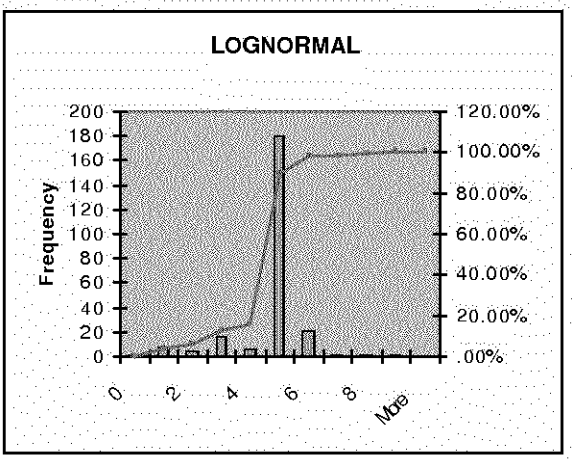
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	1	.40%
1	9	4.05%
2	5	6.07%
3	17	12.96%
4	7	15.79%
5	181	89.07%
6	22	97.98%
7	2	98.79%
8	2	99.60%
9	1	100.00%
More	0	100.00%



D'Agostino Analysis

Parameter: Benzo (g,h,i) perylene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 50
Sample Standard Deviation = 420.729
D'Agostino Statistic (D) = 0.0692965
Significance Statistic (Y) = -50.1805

5% Critical value of -2.179 and 0.986 do not contain -50.1805
Evidence of non-normality at 95% level of significance
99% Critical value of -3.36 and 1.236 do not contain -50.1805
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Benzo (g,h,i) perylene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 50
Sample Standard Deviation = 0.454082
D'Agostino Statistic (D) = 0.0692965
Significance Statistic (Y) = -50.1805

5% Critical value of -2.179 and 0.986 do not contain -50.1805
Evidence of non-normality at 95% level of significance
99% Critical value of -3.36 and 1.236 do not contain -50.1805
Evidence of non-normality at 99% level of significance

BENZO(A)PYRENE

Untransformed		Log Transformed	
Mean	151.319919	Mean	4.396058498
Standard Error	28.09394672	Standard Error	0.088203294
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	441.5310307	Standard Deviation	1.386223573
Sample Variance	194949.651	Sample Variance	1.921615794
Kurtosis	141.0638416	Kurtosis	3.665003688
Skewness	11.25673579	Skewness	-1.725635959
Range	6099.58	Range	9.583544618
Minimum	0.42	Minimum	-0.867500568
Maximum	6100	Maximum	8.71604405
Sum	39846.02	Sum	1085.826449
Count	247	Count	247
Largest(1)	6100	Largest(1)	8.71604405
Smallest(1)	0.42	Smallest(1)	-0.867500568
Confidence Level(95.0%)	55.33541903	Confidence Level(95.0%)	0.173730173

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

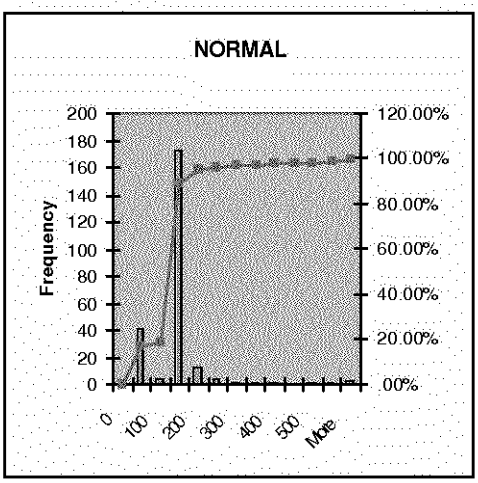
Bin Range	Frequency	Cumulative %
0	0	.00%
50	42	17.00%
100	4	18.62%
150	174	89.07%
200	14	94.74%
250	4	96.36%
300	1	96.76%
350	1	97.17%
400	1	97.57%
450	0	97.57%
500	1	97.98%
1000	2	98.79%
More	3	100.00%

Normal Distribution (95% UCL)
207.71

H = 2.476

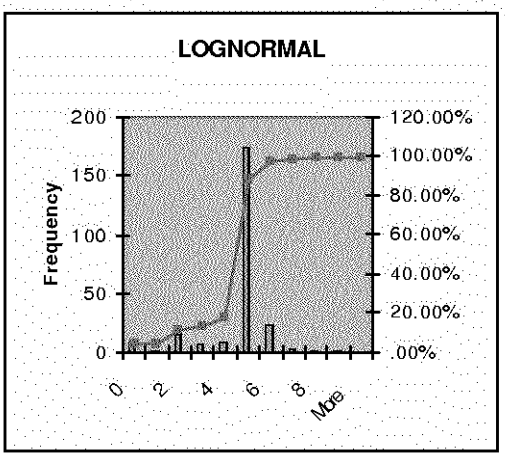
Lognormal Distribution (95% UCL)
UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **263.94**

X̄ = mean
UCL = upper confiedence limit
s = standard deviation
n = number of samples
H = H-statistic (Gilbert 1987)



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	9	3.64%
1	2	4.45%
2	16	10.93%
3	7	13.77%
4	8	17.00%
5	175	87.85%
6	24	97.57%
7	3	98.79%
8	1	99.19%
9	2	100.00%
More	0	100.00%



D'Agostino Analysis

Parameter: benzo(a)pyrene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 539.037
D'Agostino Statistic (D) = 0.124224
Significance Statistic (Y) = -87.148

5% Critical value of -1.906 and 1.357 do not contain -87.148
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -87.148
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: benzo(a)pyrene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 274
Sample Standard Deviation = 1.33205
D'Agostino Statistic (D) = 0.205966
Significance Statistic (Y) = -42.0248

5% Critical value of -1.906 and 1.357 do not contain -42.0248
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -42.0248
Evidence of non-normality at 99% level of significance

CHRYSENE

Untransformed		Log Transformed	
Mean	134.0105263	Mean	3.96324916
Standard Error	29.33452977	Standard Error	0.073772711
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	461.0283207	Standard Deviation	1.159429155
Sample Variance	212547.1153	Sample Variance	1.344275966
Kurtosis	107.3912033	Kurtosis	3.155824319
Skewness	9.549073554	Skewness	0.130567858
Range	5897.5	Range	7.766416898
Minimum	2.5	Minimum	0.916290732
Maximum	5900	Maximum	8.68270763
Sum	33100.6	Sum	978.9225425
Count	247	Count	247
Largest(1)	5900	Largest(1)	8.68270763
Smallest(1)	2.5	Smallest(1)	0.916290732
Confidence Level(95.0%)	57.77894124	Confidence Level(95.0%)	0.145306884

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	197	79.76%
100	7	82.59%
150	6	85.02%
200	18	92.31%
250	2	93.12%
300	2	93.93%
350	3	95.14%
400	1	95.55%
450	0	95.55%
500	2	96.36%
1000	3	97.57%
More	6	100.00%

Normal Distribution (95% UCL)

182.44

H = 2.267

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **121.87**

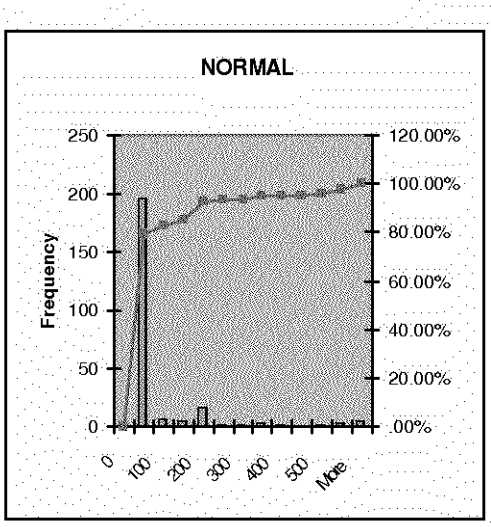
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

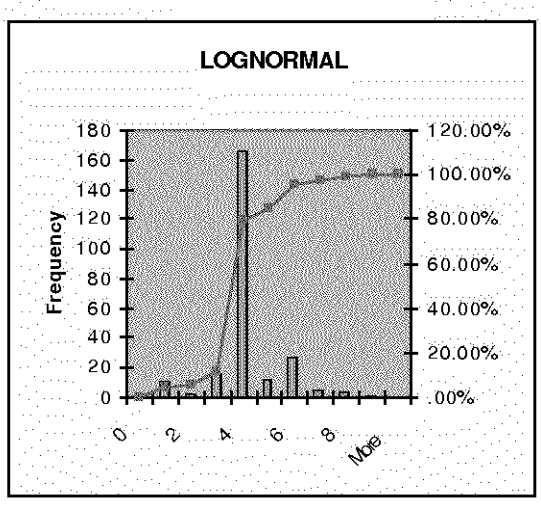
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	11	4.45%
2	3	5.67%
3	16	12.15%
4	167	79.76%
5	12	84.62%
6	27	95.55%
7	5	97.57%
8	4	99.19%
9	2	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Chrysene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 241
Sample Standard Deviation = 465.127
D'Agostino Statistic (D) = 0.093344
Significance Statistic (Y) = -97.719

5% Critical value of -1.926 and 1.328 do not contain -97.719
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -97.719
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Chrysene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 241
Sample Standard Deviation = 1.13675
D'Agostino Statistic (D) = 0.222394
Significance Statistic (Y) = -30.9078

5% Critical value of -1.926 and 1.328 do not contain -30.9078
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -30.9078
Evidence of non-normality at 99% level of significance

DIBENZ(A,H)ANTHRACENE

Untransformed		Log Transformed	
Mean	85.17651822	Mean	3.916899792
Standard Error	9.55290796	Standard Error	0.06423575
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	150.1357335	Standard Deviation	1.009544062
Sample Variance	22540.73847	Sample Variance	1.019179214
Kurtosis	54.70090088	Kurtosis	3.506737834
Skewness	6.505622143	Skewness	0.606918501
Range	1647.5	Range	6.492239835
Minimum	2.5	Minimum	0.916290732
Maximum	1650	Maximum	7.408530567
Sum	21038.6	Sum	967.4742486
Count	247	Count	247
Largest(1)	1650	Largest(1)	7.408530567
Smallest(1)	2.5	Smallest(1)	0.916290732
Confidence Level(95.0%)	18.81594531	Confidence Level(95.0%)	0.12652235

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	204	82.59%
100	2	83.40%
150	9	87.04%
200	19	94.74%
250	2	95.55%
300	2	96.36%
350	0	96.36%
400	1	96.76%
450	0	96.76%
500	3	97.98%
1000	4	99.60%
More	1	100.00%

Normal Distribution (95% UCL)

100.95

H = 2.137

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)]

95.97

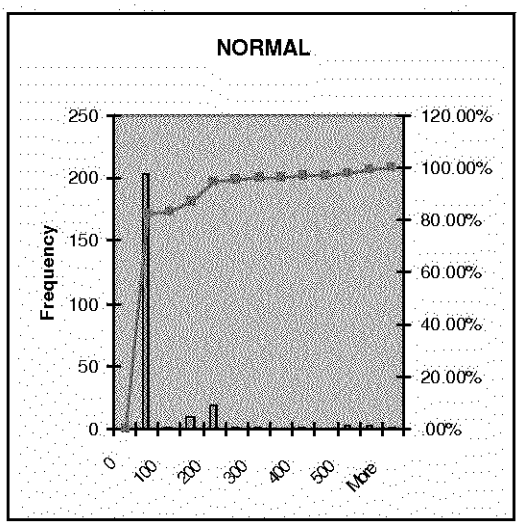
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

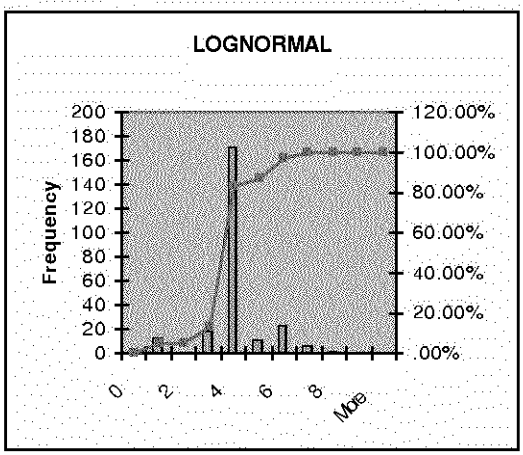
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	13	5.26%
2	0	5.26%
3	19	12.96%
4	172	82.59%
5	11	87.04%
6	24	96.76%
7	7	99.60%
8	1	100.00%
9	0	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: dibenz(a,h)anthracene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 274
Sample Standard Deviation = 716.115
D'Agostino Statistic (D) = 0.108138
Significance Statistic (Y) = -96.0279

5% Critical value of -1.906 and 1.357 do not contain -96.0279
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -96.0279
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: dibenz(a,h)anthracene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 274
Sample Standard Deviation = 1.10836
D'Agostino Statistic (D) = 0.235464
Significance Statistic (Y) = -25.7412

5% Critical value of -1.906 and 1.357 do not contain -25.7412
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -25.7412
Evidence of non-normality at 99% level of significance

FLUORANTHENE

Untransformed		Log Transformed	
Mean	204.6181781	Mean	4.093438213
Standard Error	40.09273149	Standard Error	0.081333228
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	630.1067356	Standard Deviation	1.278252021
Sample Variance	397034.4982	Sample Variance	1.633928229
Kurtosis	27.73455794	Kurtosis	3.238823767
Skewness	5.151826985	Skewness	0.62790629
Range	4599.31	Range	8.804875264
Minimum	0.69	Minimum	-0.371063681
Maximum	4600	Maximum	8.433811582
Sum	50540.69	Sum	1011.079239
Count	247	Count	247
Largest(1)	4600	Largest(1)	8.433811582
Smallest(1)	0.69	Smallest(1)	-0.371063681
Confidence Level(95.0%)	78.968901	Confidence Level(95.0%)	0.160198505

Bin Range	Frequency	Cumulative %
0	0	.00%
50	190	76.92%
100	8	80.16%
150	6	82.59%
200	17	89.47%
250	1	89.88%
300	2	90.69%
350	3	91.90%
400	3	93.12%
450	4	94.74%
500	0	94.74%
1000	2	95.55%
More	11	100.00%

Normal Distribution (95% UCL)

270.81

H = 2.372

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **164.64**

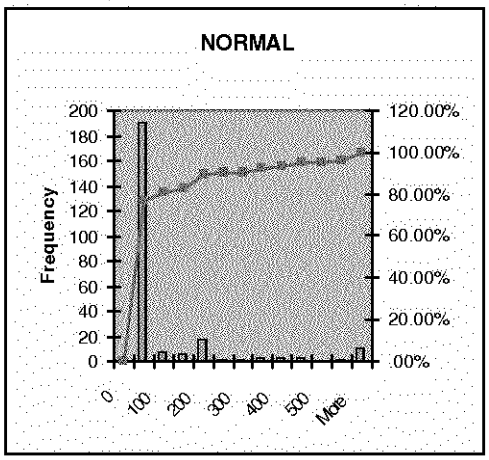
X = mean

s = standard deviation

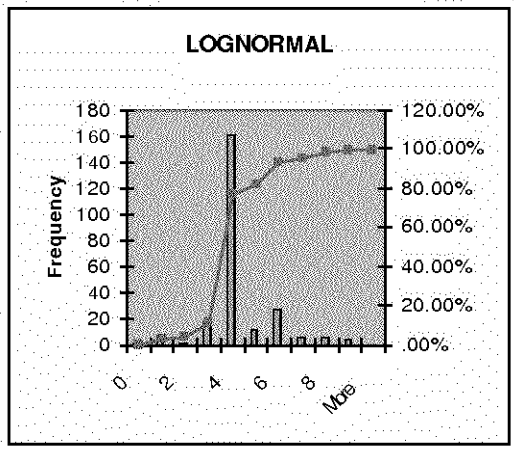
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples



Bin Range	Frequency	Cumulative %
0	1	.40%
1	7	3.24%
2	2	4.05%
3	18	11.34%
4	162	76.92%
5	13	82.19%
6	27	93.12%
7	6	95.55%
8	6	97.98%
9	5	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Fluoranthene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 241
Sample Standard Deviation = 636.976
D'Agostino Statistic (D) = 0.120013
Significance Statistic (Y) = -83.9121

5% Critical value of -1.926 and 1.328 do not contain -83.9121
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -83.9121
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Fluoranthene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 241
Sample Standard Deviation = 1.26629
D'Agostino Statistic (D) = 0.22353
Significance Statistic (Y) = -30.3201

5% Critical value of -1.926 and 1.328 do not contain -30.3201
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -30.3201
Evidence of non-normality at 99% level of significance

FLUORENE

Untransformed		Log Transformed	
Mean	155.3663968	Mean	3.967594947
Standard Error	32.44663148	Standard Error	0.073116108
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	509.9388414	Standard Deviation	1.149109842
Sample Variance	260037.622	Sample Variance	1.320453429
Kurtosis	37.65614703	Kurtosis	4.641527602
Skewness	5.949238375	Skewness	0.616506452
Range	4097.5	Range	7.402451521
Minimum	2.5	Minimum	0.916290732
Maximum	4100	Maximum	8.318742253
Sum	38375.5	Sum	979.9959518
Count	247	Count	247
Largest(1)	4100	Largest(1)	8.318742253
Smallest(1)	2.5	Smallest(1)	0.916290732
Confidence Level(95.0%)	63.90871198	Confidence Level(95.0%)	0.144013603

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	205	83.00%
100	6	85.43%
150	6	87.85%
200	15	93.93%
250	1	94.33%
300	0	94.33%
350	1	94.74%
400	0	94.74%
450	2	95.55%
500	0	95.55%
1000	3	96.76%
More	8	100.00%

Normal Distribution (95% UCL)

208.94

H = 2.259

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

120.69

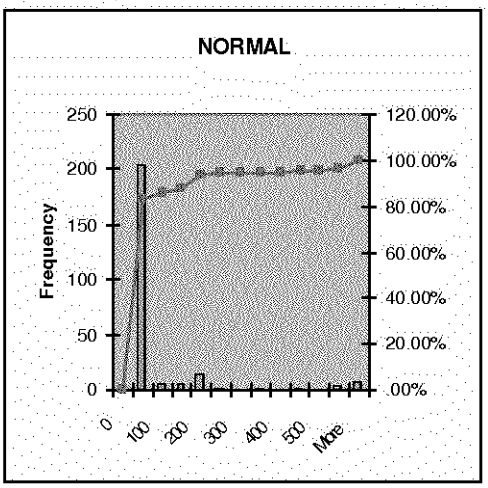
X̄ = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

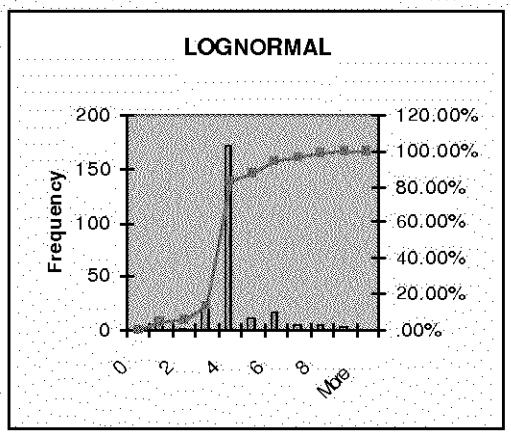
UCL = upper confiedence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	11	4.45%
2	2	5.26%
3	20	13.36%
4	172	83.00%
5	12	87.85%
6	17	94.74%
7	5	96.76%
8	5	98.79%
9	3	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Fluorene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 242
Sample Standard Deviation = 476.049
D'Agostino Statistic (D) = 0.10437
Significance Statistic (Y) = -92.2016

5% Critical value of -1.926 and 1.328 do not contain -92.2016
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -92.2016
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Fluorene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 242
Sample Standard Deviation = 1.11239
D'Agostino Statistic (D) = 0.208737
Significance Statistic (Y) = -38.057

5% Critical value of -1.926 and 1.328 do not contain -38.057
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -38.057
Evidence of non-normality at 99% level of significance

INDENO(1,2,3-CD)PYRENE

Untransformed		Log Transformed	
Mean	124.051417	Mean	4.450890451
Standard Error	8.566940061	Standard Error	0.072302436
Median	125	Median	4.828313737
Mode	125	Mode	4.828313737
Standard Deviation	134.6400316	Standard Deviation	1.136321982
Sample Variance	18127.93812	Sample Variance	1.291227646
Kurtosis	154.4375784	Kurtosis	4.325414322
Skewness	11.17886731	Skewness	-2.096971356
Range	1999.5	Range	8.29404964
Minimum	0.5	Minimum	-0.693147181
Maximum	2000	Maximum	7.60090246
Sum	30640.7	Sum	1099.369941
Count	247	Count	247
Largest(1)	2000	Largest(1)	7.60090246
Smallest(1)	0.5	Smallest(1)	-0.693147181
Confidence Level(95.0%)	16.87392743	Confidence Level(95.0%)	0.142410949

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

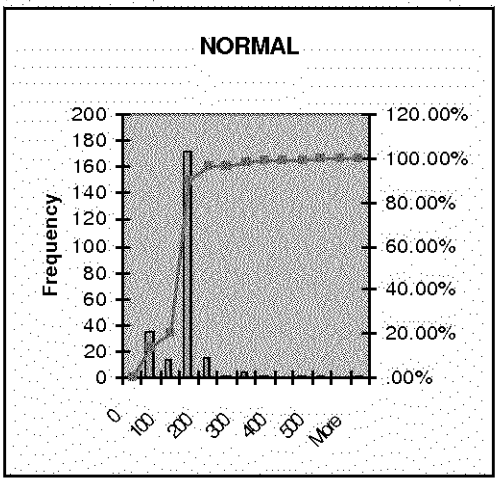
Bin Range	Frequency	Cumulative %
0	0	.00%
50	35	14.17%
100	14	19.84%
150	172	89.47%
200	16	95.95%
250	1	96.36%
300	5	98.38%
350	1	98.79%
400	0	98.79%
450	1	99.19%
500	1	99.60%
1000	0	99.60%
More	1	100.00%

Normal Distribution (95% UCL)
138.20

H = 2.247

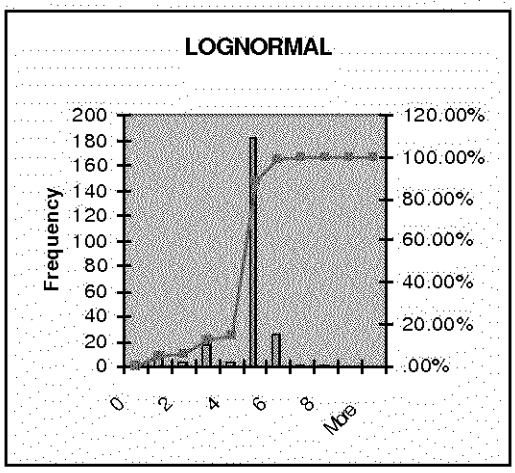
Lognormal Distribution (95% UCL)
UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **192.34**

X̄ = mean
UCL = upper confiedence limit
s = standard deviation
n = number of samples
H = H-statistic (Gilbert 1987)



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	1	.40%
1	10	4.45%
2	3	5.67%
3	18	12.96%
4	4	14.57%
5	183	88.66%
6	25	98.79%
7	2	99.60%
8	1	100.00%
9	0	100.00%
More	0	100.00%



D'Agostino Analysis

Parameter: indeno(1,2,3-cd)pyrene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 392.114
D'Agostino Statistic (D) = 0.137715
Significance Statistic (Y) = -79.7009

5% Critical value of -1.906 and 1.357 do not contain -79.7009
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -79.7009
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: indeno(1,2,3-cd)pyrene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 274
Sample Standard Deviation = 1.15611
D'Agostino Statistic (D) = 0.205134
Significance Statistic (Y) = -42.4841

5% Critical value of -1.906 and 1.357 do not contain -42.4841
Evidence of non-normality at 95% level of significance
99% Critical value of -2.816 and 1.826 do not contain -42.4841
Evidence of non-normality at 99% level of significance

2-METHYLNAPTHALENE

Untransformed		Log Transformed	
Mean	560.9583333	Mean	4.35139
Standard Error	181.7993595	Standard Error	0.076184
Median	50	Median	3.912023
Mode	50	Mode	3.912023
Standard Deviation	2671.893998	Standard Deviation	1.119667
Sample Variance	7139017.538	Sample Variance	1.253654
Kurtosis	39.28844016	Kurtosis	13.6405
Skewness	6.114289347	Skewness	3.605099
Range	21950	Range	6.086775
Minimum	50	Minimum	3.912023
Maximum	22000	Maximum	9.998798
Sum	121167	Sum	939.9001
Count	216	Count	216
Largest(1)	22000	Largest(1)	9.998798
Smallest(1)	50	Smallest(1)	3.912023
Confidence Level(95.0%)	358.3368852	Confidence Level(95.0%)	0.150162

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	167	77.31%
100	2	78.24%
150	0	78.24%
200	37	95.37%
250	0	95.37%
300	0	95.37%
350	1	95.83%
400	0	95.83%
450	0	95.83%
500	0	95.83%
1000	0	95.83%
More	9	100.00%

Normal Distribution (95% UCL)

861.29

H = 2.243

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

172.35

X̄ = mean

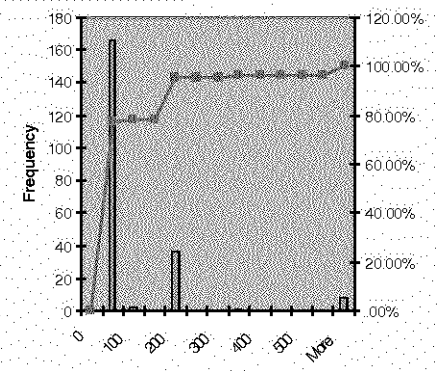
s = standard deviation

H = H-statistic (Gilbert 1987)

UCL = upper confidence limit

n = number of samples

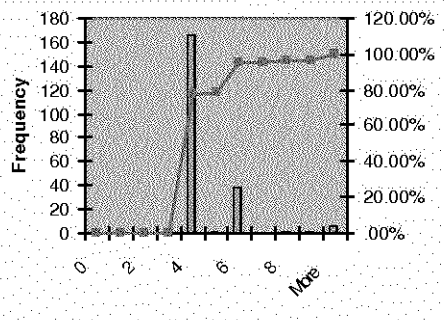
NORMAL



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	0	.00%
2	0	.00%
3	0	.00%
4	167	77.31%
5	2	78.24%
6	38	95.83%
7	0	95.83%
8	1	96.30%
9	1	96.76%
More	7	100.00%

LOGNORMAL



NAPTHALENE

Untransformed		Log Transformed	
Mean	114.1686692	Mean	2.639549177
Standard Error	22.86123108	Standard Error	0.11606191
Median	50	Median	3.912023005
Mode	1.25	Mode	0.223143551
Standard Deviation	425.8575497	Standard Deviation	2.16199384
Sample Variance	181354.6527	Sample Variance	4.674217366
Kurtosis	68.91559878	Kurtosis	-1.113595609
Skewness	7.659419395	Skewness	0.121825521
Range	4798.75	Range	8.253227646
Minimum	1.25	Minimum	0.223143551
Maximum	4800	Maximum	8.476371197
Sum	39595.5	Sum	915.9235644
Count	347	Count	347
Largest(1)	4800	Largest(1)	8.476371197
Smallest(1)	1.25	Smallest(1)	0.223143551
Confidence Level(95.0%)	44.96451993	Confidence Level(95.0%)	0.228275809

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	284	81.84%
100	23	88.47%
150	1	88.76%
200	20	94.52%
250	0	94.52%
300	1	94.81%
350	1	95.10%
400	1	95.39%
450	0	95.39%
500	2	95.97%
1000	5	97.41%
More	9	100.00%

Normal Distribution (95% UCL)

151.81

H = 3.252

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s² + sH/ ((n-1)^.5)]

211.59

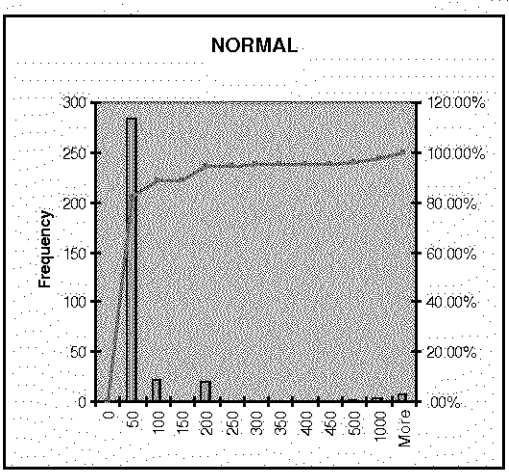
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

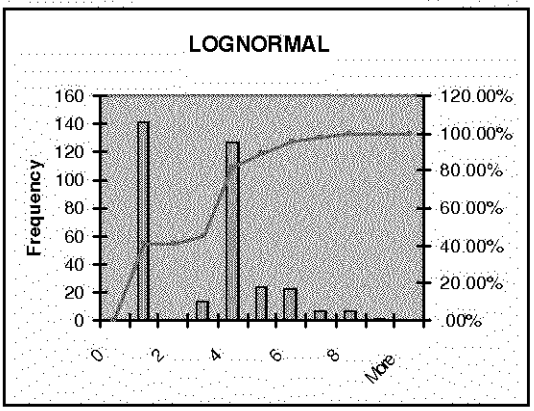
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	142	40.92%
2	0	40.92%
3	15	45.24%
4	127	81.84%
5	24	88.76%
6	23	95.39%
7	7	97.41%
8	7	99.42%
9	2	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Naphthalene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 221
Sample Standard Deviation = 517.326
D'Agostino Statistic (D) = 0.121629
Significance Statistic (Y) = -79.5538

5% Critical value of -1.926 and 1.328 do not contain -79.5538
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -79.5538
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Naphthalene
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 221
Sample Standard Deviation = 2.19078
D'Agostino Statistic (D) = 0.267117
Significance Statistic (Y) = -7.42548

5% Critical value of -1.926 and 1.328 do not contain -7.42548
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -7.42548
Evidence of non-normality at 99% level of significance

PHENANTHRENE

Untransformed		Log Transformed	
Mean	363.938664	Mean	4.095773156
Standard Error	89.77385506	Standard Error	0.090691024
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	1410.906881	Standard Deviation	1.425321327
Sample Variance	1990658.228	Sample Variance	2.031540886
Kurtosis	30.67210169	Kurtosis	3.789332148
Skewness	5.449699934	Skewness	1.121094254
Range	10997.5	Range	8.38935982
Minimum	2.5	Minimum	0.916290732
Maximum	11000	Maximum	9.305650552
Sum	89892.85	Sum	1011.65597
Count	247	Count	247
Largest(1)	11000	Largest(1)	9.305650552
Smallest(1)	2.5	Smallest(1)	0.916290732
Confidence Level(95.0%)	176.8236388	Confidence Level(95.0%)	0.178630147

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	196	79.35%
100	5	81.38%
150	6	83.81%
200	13	89.07%
250	6	91.50%
300	1	91.90%
350	1	92.31%
400	2	93.12%
450	0	93.12%
500	0	93.12%
1000	3	94.33%
More	14	100.00%

Normal Distribution (95% UCL)

512.16

H = 2.514

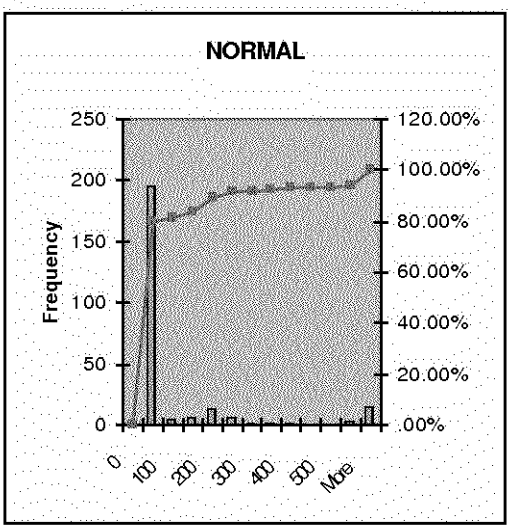
Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **208.51**

$\bar{X}$ = mean — UCL = upper confiedence limit

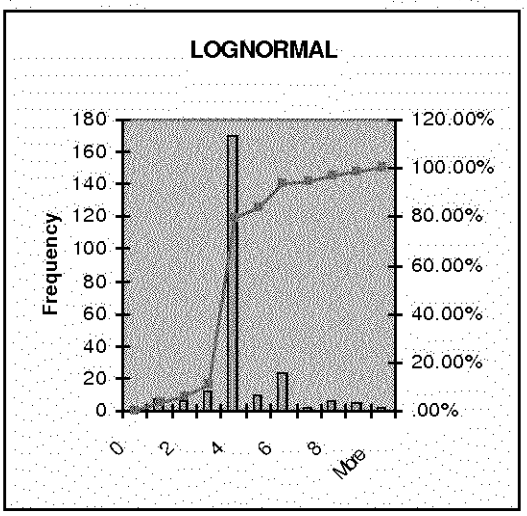
s = standard deviation — n = number of samples

H = H-statistic (Gilbert 1987)



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	0	.00%
1	8	3.24%
2	6	5.67%
3	13	10.93%
4	170	79.76%
5	10	83.81%
6	23	93.12%
7	3	94.33%
8	6	96.76%
9	5	98.79%
More	3	100.00%



D'Agostino Analysis

Parameter: Phenanthrene

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 236
Sample Standard Deviation = 1424.29
D'Agostino Statistic (D) = 0.106968
Significance Statistic (Y) = -89.7202

5% Critical value of -1.926 and 1.328 do not contain -89.7202
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -89.7202
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Phenanthrene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 236
Sample Standard Deviation = 1.3792
D'Agostino Statistic (D) = 0.213215
Significance Statistic (Y) = -35.2882

5% Critical value of -1.926 and 1.328 do not contain -35.2882
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -35.2882
Evidence of non-normality at 99% level of significance

PYRENE

Untransformed		Log Transformed	
Mean	164.9288	Mean	4.087983646
Standard Error	29.59968005	Standard Error	0.075480454
Median	50	Median	3.912023005
Mode	50	Mode	3.912023005
Standard Deviation	468.0120348	Standard Deviation	1.186268446
Sample Variance	219035.2647	Sample Variance	1.407232825
Kurtosis	36.3482986	Kurtosis	3.770979212
Skewness	5.759282468	Skewness	0.331970751
Range	3899.4	Range	8.779557456
Minimum	0.6	Minimum	-0.510825624
Maximum	3900	Maximum	8.268731832
Sum	41232.2	Sum	1009.731961
Count	250	Count	247
Largest(1)	3900	Largest(1)	8.268731832
Smallest(1)	0.6	Smallest(1)	-0.510825624
Confidence Level(95.0%)	58.29769646	Confidence Level(95.0%)	0.148670551

Bin Range
0
50
100
150
200
250
300
350
400
450
500
1000

Bin Range	Frequency	Cumulative %
0	0	.00%
50	189	75.60%
100	6	78.00%
150	10	82.00%
200	20	90.00%
250	3	91.20%
300	2	92.00%
350	2	92.80%
400	5	94.80%
450	0	94.80%
500	1	95.20%
1000	3	96.40%
More	9	100.00%

Normal Distribution (95% UCL)

213.80

H = 2288

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **143.27**

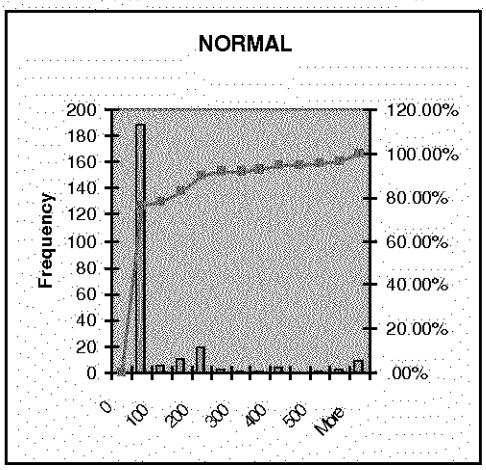
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

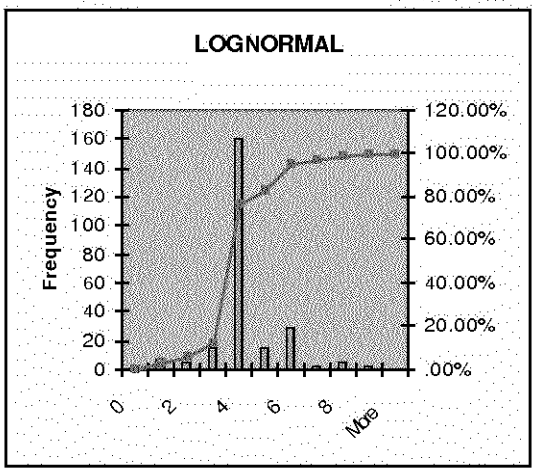
UCL = upper confidence limit

n = number of samples



Bin Range
0
1
2
3
4
5
6
7
8
9

Bin Range	Frequency	Cumulative %
0	1	.40%
1	7	3.24%
2	5	5.26%
3	16	11.74%
4	160	76.52%
5	16	83.00%
6	30	95.14%
7	3	96.36%
8	6	98.79%
9	3	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Pyrene
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 242
Sample Standard Deviation = 473.76
D'Agostino Statistic (D) = 0.120311
Significance Statistic (Y) = -83.9313

5% Critical value of -1.926 and 1.328 do not contain -83.9313
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -83.9313
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Pyrene

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 242
Sample Standard Deviation = 1.18015
D'Agostino Statistic (D) = 0.222313
Significance Statistic (Y) = -31.0143

5% Critical value of -1.926 and 1.328 do not contain -31.0143
Evidence of non-normality at 95% level of significance
99% Critical value of -2.861 and 1.779 do not contain -31.0143
Evidence of non-normality at 99% level of significance

ARSENIC

Untransformed		Log Transformed	
Mean	3.232801519	Mean	0.924093404
Standard Error	0.059432069	Standard Error	0.025344782
Median	3.3	Median	1.193922468
Mode	0.5	Mode	-0.693147181
Standard Deviation	1.928568352	Standard Deviation	0.822437196
Sample Variance	3.719375889	Sample Variance	0.676402941
Kurtosis	16.0085468	Kurtosis	0.05908972
Skewness	1.92334087	Skewness	-1.104695972
Range	23	Range	3.850147602
Minimum	0.5	Minimum	-0.693147181
Maximum	23.5	Maximum	3.157000421
Sum	3404.14	Sum	973.0703549
Count	1053	Count	1053
Largest(1)	23.5	Largest(1)	3.157000421
Smallest(1)	0.5	Smallest(1)	-0.693147181
Confidence Level(95.0%)	0.116618865	Confidence Level(95.0%)	0.049732068

Bin Range
0
1
2
3
4
5
6
7
8
9
10

Bin Range	Frequency	Cumulative %
0	0	.00%
1	191	18.14%
2	47	22.60%
3	204	41.98%
4	306	71.04%
5	192	89.27%
6	69	95.82%
7	19	97.63%
8	9	98.48%
9	6	99.05%
10	5	99.53%
More	5	100.00%

Normal Distribution (95% UCL)

3.33

H = 1.946

Lognormal Distribution (95% UCL)

UCL = e ^ [x̄ + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

3.71

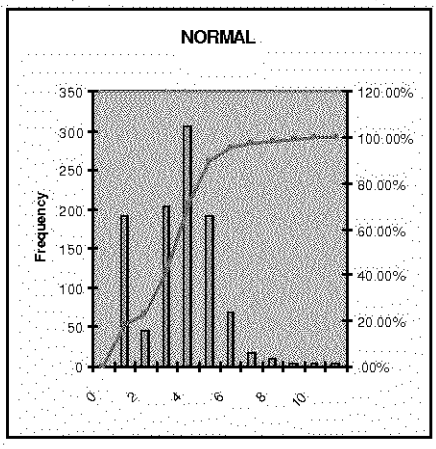
X̄ = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

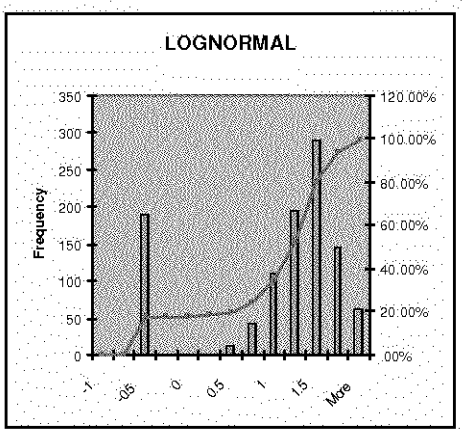
UCL = upper confiedence limit

n = number of samples



Bin Range
-1
-0.75
-0.5
-0.25
0
0.25
0.5
0.75
1
1.25
1.5
1.75

Bin Range	Frequency	Cumulative %
-1	0	.00%
-0.75	0	.00%
-0.5	190	18.04%
-0.25	0	18.04%
0	1	18.14%
0.25	1	18.23%
0.5	14	19.56%
0.75	44	23.74%
1	111	34.28%
1.25	194	52.71%
1.5	289	80.15%
1.75	146	94.02%
More	63	100.00%



CADMIUM

Untransformed		Log Transformed	
Mean	0.357233369	Mean	-1.568549246
Standard Error	0.058100755	Standard Error	0.030238139
Median	0.25	Median	-1.386294361
Mode	0.25	Mode	-1.386294361
Standard Deviation	1.787955756	Standard Deviation	0.930529288
Sample Variance	3.196785784	Sample Variance	0.865884757
Kurtosis	792.7028551	Kurtosis	0.993080564
Skewness	27.29867613	Skewness	-0.026157014
Range	52.85	Range	6.964135612
Minimum	0.05	Minimum	-2.995732274
Maximum	52.9	Maximum	3.968403339
Sum	347.77	Sum	-1485.416136
Count	947	Count	947
Largest(1)	52.9	Largest(1)	3.968403339
Smallest(1)	0.05	Smallest(1)	-2.995732274
Confidence Level(95.0%)	0.114021328	Confidence Level(95.0%)	0.059341617

Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	229	24.18%
0.2	50	29.46%
0.3	409	72.65%
0.4	59	78.88%
0.5	56	84.79%
0.6	44	89.44%
0.7	39	93.56%
0.8	23	95.99%
0.9	16	97.68%
1	9	98.63%
More	13	100.00%

Normal Distribution (95% UCL)

0.46

H = 2.021

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **0.34**

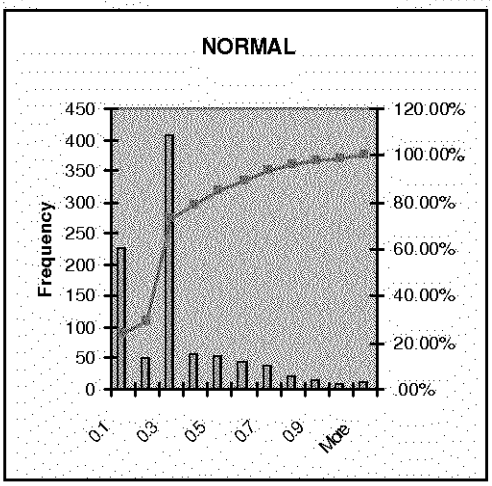
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

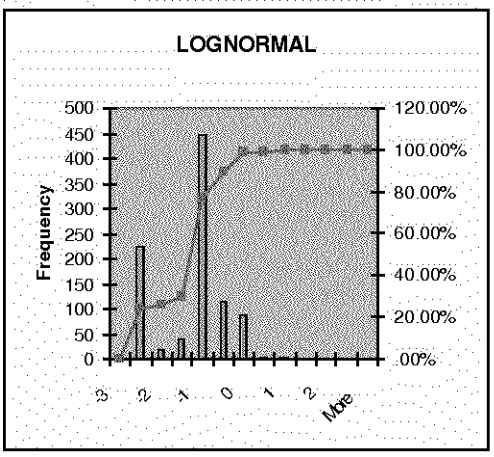
UCL = upper confiedence limit

n = number of samples



Bin Range
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

Bin Range	Frequency	Cumulative %
-3	0	.00%
-2.5	225	23.76%
-2	19	25.77%
-1.5	39	29.88%
-1	447	77.09%
-0.5	117	89.44%
0	87	98.63%
0.5	6	99.26%
1	3	99.58%
1.5	1	99.68%
2	1	99.79%
2.5	0	99.79%
More	2	100.00%



D'Agostino Analysis
Parameter: Cadmium
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 1.78796
D'Agostino Statistic (D) = 0.0538337
Significance Statistic (Y) = -234.255

5% Critical value of -1.796 and 1.485 do not contain -234.255
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -234.255
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Cadmium
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.930529
D'Agostino Statistic (D) = 0.263176
Significance Statistic (Y) = -19.4158

5% Critical value of -1.796 and 1.485 do not contain -19.4158
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -19.4158
Evidence of non-normality at 99% level of significance

HEXAVALENT CHROMIUM

Untransformed		Log Transformed	
Mean	0.166034483	Mean	-2.587597296
Standard Error	0.084367167	Standard Error	0.164709789
Median	0.05	Median	-2.995732274
Mode	0.05	Mode	-2.995732274
Standard Deviation	0.454331	Standard Deviation	0.886989358
Sample Variance	0.206416749	Sample Variance	0.786750121
Kurtosis	27.47960025	Kurtosis	8.073675832
Skewness	5.187137305	Skewness	2.672763925
Range	2.45	Range	3.912023005
Minimum	0.05	Minimum	-2.995732274
Maximum	2.5	Maximum	0.916290732
Sum	4.815	Sum	-75.04032158
Count	29	Count	29
Largest(1)	2.5	Largest(1)	0.916290732
Smallest(1)	0.05	Smallest(1)	-2.995732274
Confidence Level(95.0%)	0.172818502	Confidence Level(95.0%)	0.337393087

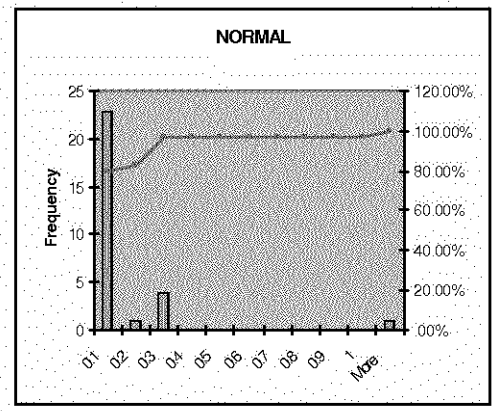
Normal Distribution (95% UCL)	
	0.31

H =	2.305
Lognormal Distribution (95% UCL) UCL = e ^ [x +0.5 s² + sH/ ((n-1)^.5)]	**0.16**

X = mean
s = standard deviation
H = H-statistic (Gilbert 1987)
UCL = upper confidence limit
n = number of samples

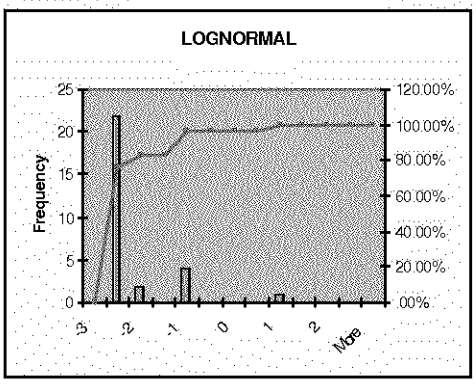
Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	23	79.31%
0.2	1	82.76%
0.3	4	96.55%
0.4	0	96.55%
0.5	0	96.55%
0.6	0	96.55%
0.7	0	96.55%
0.8	0	96.55%
0.9	0	96.55%
1	0	96.55%
More	1	100.00%



Bin Range
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

Bin Range	Frequency	Cumulative %
-3	0	.00%
-2.5	22	75.86%
-2	2	82.76%
-1.5	0	82.76%
-1	4	96.55%
-0.5	0	96.55%
0	0	96.55%
0.5	0	96.55%
1	1	100.00%
1.5	0	100.00%
2	0	100.00%
2.5	0	100.00%
More	0	100.00%



COPPER

Untransformed		Log Transformed	
Mean	22.01590198	Mean	2.930151439
Standard Error	1.199345779	Standard Error	0.016672749
Median	19.1	Median	2.949688335
Mode	15	Mode	2.708050201
Standard Deviation	37.14101043	Standard Deviation	0.516317101
Sample Variance	1379.454656	Sample Variance	0.266583349
Kurtosis	744.5386367	Kurtosis	24.01670344
Skewness	25.93040517	Skewness	-1.339771911
Range	1099.95	Range	9.998797732
Minimum	0.05	Minimum	-2.995732274
Maximum	1100	Maximum	7.003065459
Sum	21113.25	Sum	2810.01523
Count	959	Count	959
Largest(1)	1100	Largest(1)	7.003065459
Smallest(1)	0.05	Smallest(1)	-2.995732274
Confidence Level(95.0%)	2.353648931	Confidence Level(95.0%)	0.032719336

Bin Range
0
5
10
15
20
25
30
35
40
45
50

Bin Range	Frequency	Cumulative %
0	0	.00%
5	10	1.04%
10	82	9.59%
15	160	26.28%
20	286	56.10%
25	198	76.75%
30	113	88.53%
35	63	95.10%
40	19	97.08%
45	5	97.60%
50	11	98.75%
More	12	100.00%

Normal Distribution (95% UCL)

23.99

H = 1.777

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **22.05**

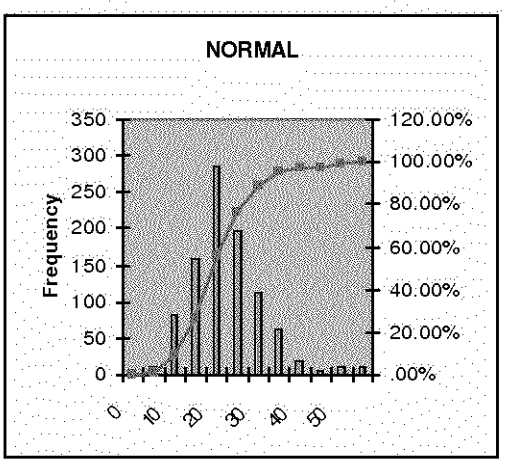
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

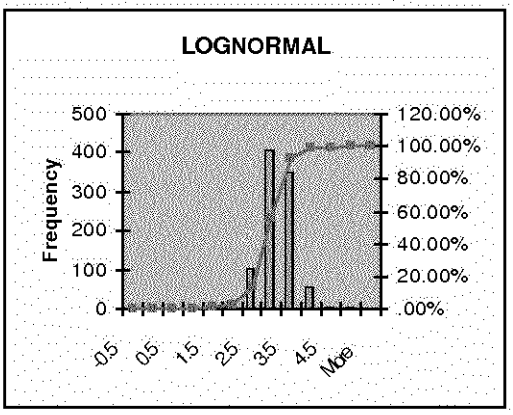
UCL = upper confiedence limit

n = number of samples



Bin Range
-0.5
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

Bin Range	Frequency	Cumulative %
-0.5	1	.10%
0	1	.21%
0.5	0	.21%
1	1	.31%
1.5	4	.73%
2	19	2.71%
2.5	104	13.56%
3	408	56.10%
3.5	352	92.81%
4	57	98.75%
4.5	6	99.37%
5	4	99.79%
More	2	100.00%



D'Agostino Analysis

Parameter: Copper

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 959
Sample Standard Deviation = 37.141
D'Agostino Statistic (D) = 0.0834721
Significance Statistic (Y) = -205.126

5% Critical value of -1.792 and 1.489 do not contain -205.126
Evidence of non-normality at 95% level of significance
99% Critical value of -2.599 and 2.052 do not contain -205.126
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Copper

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 959
Sample Standard Deviation = 0.516317
D'Agostino Statistic (D) = 0.245285
Significance Statistic (Y) = -38.0144

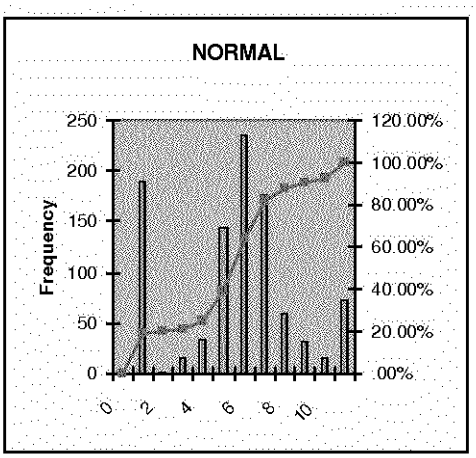
5% Critical value of -1.792 and 1.489 do not contain -38.0144
Evidence of non-normality at 95% level of significance
99% Critical value of -2.599 and 2.052 do not contain -38.0144
Evidence of non-normality at 99% level of significance

LEAD

Untransformed		Log Transformed	
Mean	7.839692938	Mean	1.354916627
Standard Error	1.196265604	Standard Error	0.035443793
Median	5.4	Median	1.686398954
Mode	0.5	Mode	-0.693147181
Standard Deviation	37.39167306	Standard Deviation	1.107866615
Sample Variance	1398.137214	Sample Variance	1.227368438
Kurtosis	563.9292157	Kurtosis	1.261334732
Skewness	22.09316485	Skewness	-0.595458385
Range	1019.5	Range	7.620705087
Minimum	0.5	Minimum	-0.693147181
Maximum	1020	Maximum	6.927557906
Sum	7659.38	Sum	1323.753544
Count	977	Count	977
Largest(1)	1020	Largest(1)	6.927557906
Smallest(1)	0.5	Smallest(1)	-0.693147181
Confidence Level(95.0%)	2.347549861	Confidence Level(95.0%)	0.069554848

Bin Range
0
1
2
3
4
5
6
7
8
9
10

Bin Range	Frequency	Cumulative %
0	0	.00%
1	190	19.45%
2	1	19.55%
3	15	21.08%
4	33	24.46%
5	145	39.30%
6	237	63.56%
7	176	81.58%
8	60	87.72%
9	31	90.89%
10	15	92.43%
More	74	100.00%



Normal Distribution (95% UCL)

9.81

H = 2.155

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$]

7.73

X = mean

s = standard deviation

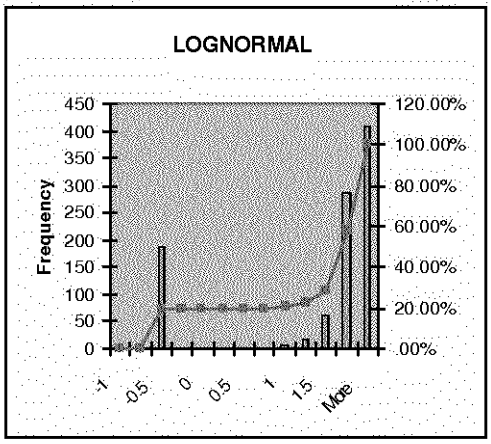
H = H-statistic (Gilbert 1987)

UCL = upper confidence limit

n = number of samples

Bin Range
-1
-0.75
-0.5
-0.25
0
0.25
0.5
0.75
1
1.25
1.5
1.75

Bin Range	Frequency	Cumulative %
-1	0	.00%
-0.75	0	.00%
-0.5	189	19.34%
-0.25	0	19.34%
0	1	19.45%
0.25	0	19.45%
0.5	1	19.55%
0.75	1	19.65%
1	7	20.37%
1.25	19	22.31%
1.5	62	28.66%
1.75	286	57.93%
More	411	100.00%



D'Agostino Analysis

Parameter: Lead

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 977
Sample Standard Deviation = 37.3917
D'Agostino Statistic (D) = 0.0567211
Significance Statistic (Y) = -234.927

5% Critical value of -1.792 and 1.489 do not contain -234.927
Evidence of non-normality at 95% level of significance
99% Critical value of -2.599 and 2.052 do not contain -234.927
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Lead

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 977
Sample Standard Deviation = 1.10787
D'Agostino Statistic (D) = 0.244101
Significance Statistic (Y) = -39.6046

5% Critical value of -1.792 and 1.489 do not contain -39.6046
Evidence of non-normality at 95% level of significance
99% Critical value of -2.599 and 2.052 do not contain -39.6046
Evidence of non-normality at 99% level of significance

MERCURY

Untransformed		Log Transformed	
Mean	0.041042239	Mean	-3.585279957
Standard Error	0.001410816	Standard Error	0.032388553
Median	0.043	Median	-3.146555163
Mode	0.05	Mode	-2.995732274
Standard Deviation	0.043415568	Standard Deviation	0.996704776
Sample Variance	0.001884912	Sample Variance	0.993420411
Kurtosis	80.86489582	Kurtosis	-0.332051516
Skewness	7.348120001	Skewness	-0.759552924
Range	0.595	Range	4.787491743
Minimum	0.005	Minimum	-5.298317367
Maximum	0.6	Maximum	-0.510825624
Sum	38.867	Sum	-3395.260119
Count	947	Count	947
Largest(1)	0.6	Largest(1)	-0.510825624
Smallest(1)	0.005	Smallest(1)	-5.298317367
Confidence Level(95.0%)	0.002768693	Confidence Level(95.0%)	0.063561753

Bin Range
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

Bin Range	Frequency	Cumulative %
0.01	215	22.70%
0.01	0	22.70%
0.02	4	23.13%
0.03	102	33.90%
0.04	132	47.84%
0.05	367	86.59%
0.06	38	90.60%
0.07	28	93.56%
0.08	17	95.35%
0.09	6	95.99%
More	38	100.00%

Normal Distribution (95% UCL)

0.04

H = 2.066

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **0.05**

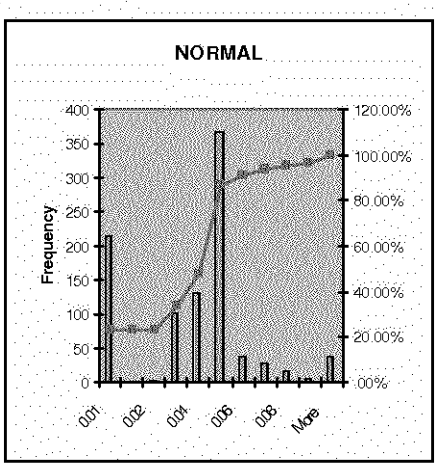
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

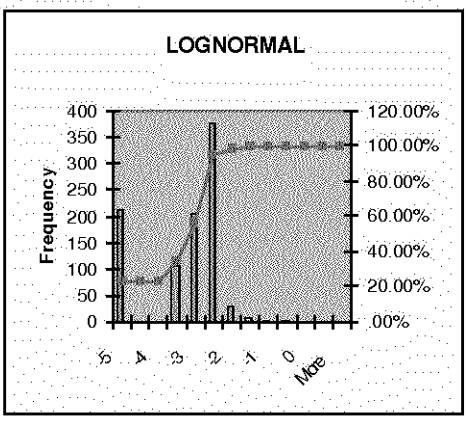
UCL = upper confiedence limit

n = number of samples



Bin Range
-5
-4.5
-4
-3.5
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5

Bin Range	Frequency	Cumulative %
-5	214	22.60%
-4.5	1	22.70%
-4	0	22.70%
-3.5	106	33.90%
-3	206	55.65%
-2.5	376	95.35%
-2	30	98.52%
-1.5	7	99.26%
-1	3	99.58%
-0.5	4	100.00%
0	0	100.00%
0.5	0	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Mercury
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.0434156
D'Agostino Statistic (D) = 0.180184
Significance Statistic (Y) = -104.587

5% Critical value of -1.796 and 1.485 do not contain -104.587
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -104.587
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Mercury

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 947
Sample Standard Deviation = 0.996705
D'Agostino Statistic (D) = 0.255295
Significance Statistic (Y) = -27.5033

5% Critical value of -1.796 and 1.485 do not contain -27.5033
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -27.5033
Evidence of non-normality at 99% level of significance

MOLYBDENUM

Untransformed		Log Transformed	
Mean	0.952048574	Mean	-0.33044718
Standard Error	0.026001041	Standard Error	0.025292525
Median	0.73	Median	-0.314710745
Mode	0.25	Mode	-1.386294361
Standard Deviation	0.80013954	Standard Deviation	0.778335096
Sample Variance	0.640223283	Sample Variance	0.605807078
Kurtosis	40.68482947	Kurtosis	-1.083404099
Skewness	3.875095785	Skewness	0.024863151
Range	11.75	Range	3.871201011
Minimum	0.25	Minimum	-1.386294361
Maximum	12	Maximum	2.484906665
Sum	911.06	Sum	-312.9334799
Count	947	Count	947
Largest(1)	12	Largest(1)	2.484906665
Smallest(1)	0.25	Smallest(1)	-1.386294361
Confidence Level(95.0%)	0.051026415	Confidence Level(95.0%)	0.049635968

Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	0	.00%
0.2	0	.00%
0.3	226	23.86%
0.4	34	27.46%
0.5	129	41.08%
0.6	29	44.14%
0.7	44	48.79%
0.8	30	51.95%
0.9	39	56.07%
1	44	60.72%
More	372	100.00%

Normal Distribution (95% UCL)

1.00

H = 1.919

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **1.02**

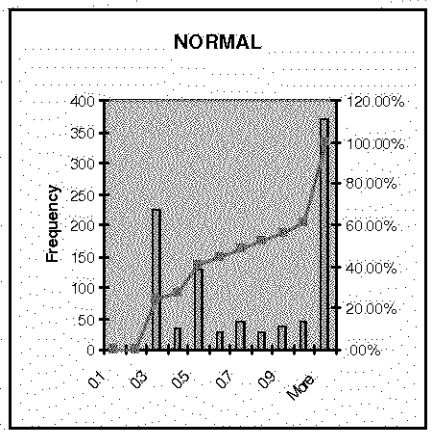
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

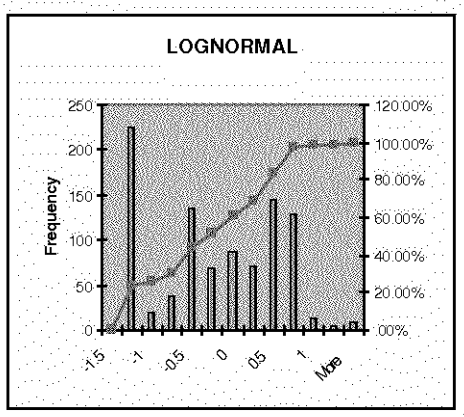
UCL = upper confiedence limit

n = number of samples



Bin Range
-1.5
-1.25
-1
-0.75
-0.5
-0.25
0
0.25
0.5
0.75
1
1.25

Bin Range	Frequency	Cumulative %
-1.5	0	.00%
-1.25	225	23.76%
-1	19	25.77%
-0.75	38	29.78%
-0.5	136	44.14%
-0.25	70	51.53%
0	87	60.72%
0.25	71	68.22%
0.5	144	83.42%
0.75	130	97.15%
1	13	98.52%
1.25	5	99.05%
More	9	100.00%



D'Agostino Analysis
Parameter: Molybdenum
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.80014
D'Agostino Statistic (D) = 0.24132
Significance Statistic (Y) = -41.8458

5% Critical value of -1.796 and 1.485 do not contain -41.8458
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -41.8458
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Molybdenum
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.778336
D'Agostino Statistic (D) = 0.284315
Significance Statistic (Y) = 2.27894

5% Critical value of -1.796 and 1.485 do not contain 2.27894
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain 2.27894
Evidence of non-normality at 99% level of significance

SELENIUM

Untransformed		Log Transformed	
Mean	0.61405491	Mean	-0.883490222
Standard Error	0.027773909	Standard Error	0.024171946
Median	0.25	Median	-1.386294361
Mode	0.25	Mode	-1.386294361
Standard Deviation	0.854696656	Standard Deviation	0.743852113
Sample Variance	0.730506373	Sample Variance	0.553315966
Kurtosis	72.14038730	Kurtosis	1.773304014
Skewness	6.100620870	Skewness	1.614033170
Range	13.75	Range	4.025351691
Minimum	0.25	Minimum	-1.386294361
Maximum	14	Maximum	2.639057330
Sum	581.51	Sum	-836.66524
Count	947	Count	947
Largest(1)	14	Largest(1)	2.639057330
Smallest(1)	0.25	Smallest(1)	-1.386294361
Confidence Level(95.0%)	0.054505626	Confidence Level(95.0%)	0.047436859

Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	0	.00%
0.2	0	.00%
0.3	536	56.60%
0.4	2	56.81%
0.5	249	83.10%
0.6	15	84.69%
0.7	14	86.17%
0.8	6	86.80%
0.9	5	87.33%
1	7	88.07%
More	113	100.00%

Normal Distribution (95% UCL)

0.66

H = 1.896

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **0.57**

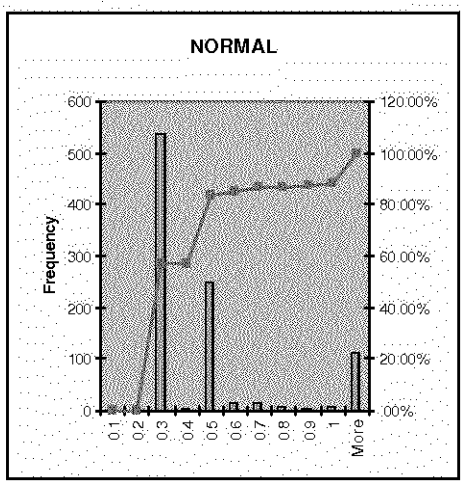
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

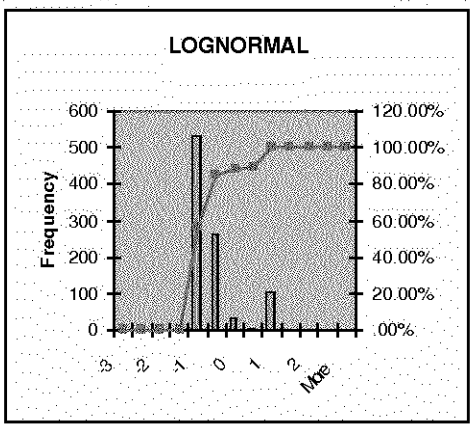
UCL = upper confiedence limit

n = number of samples



Bin Range
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

Bin Range	Frequency	Cumulative %
-3	0	.00%
-2.5	0	.00%
-2	0	.00%
-1.5	0	.00%
-1	536	56.60%
-0.5	266	84.69%
0	32	88.07%
0.5	7	88.81%
1	104	99.79%
1.5	0	99.79%
2	0	99.79%
2.5	1	99.89%
More	1	100.00%



D'Agostino Analysis
Parameter: Selenium
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.854697
D'Agostino Statistic (D) = 0.169276
Significance Statistic (Y) = -115.781

5% Critical value of -1.796 and 1.485 do not contain -115.781
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -115.781
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Selenium
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.743852
D'Agostino Statistic (D) = 0.234588
Significance Statistic (Y) = -48.7544

5% Critical value of -1.796 and 1.485 do not contain -48.7544
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -48.7544
Evidence of non-normality at 99% level of significance

SILVER

Untransformed		Log Transformed	
Mean	0.377529039	Mean	-1.306354686
Standard Error	0.008160582	Standard Error	0.03181286
Median	0.5	Median	-0.693147181
Mode	0.5	Mode	-0.693147181
Standard Deviation	0.251128569	Standard Deviation	0.978988749
Sample Variance	0.063065558	Sample Variance	0.958418971
Kurtosis	61.86567436	Kurtosis	-0.630448116
Skewness	4.275873363	Skewness	-1.013792085
Range	4.15	Range	4.430816799
Minimum	0.05	Minimum	-2.995732274
Maximum	4.2	Maximum	1.435084525
Sum	357.52	Sum	-1237.117987
Count	947	Count	947
Largest(1)	4.2	Largest(1)	1.435084525
Smallest(1)	0.05	Smallest(1)	-2.995732274
Confidence Level(95.0%)	0.016014945	Confidence Level(95.0%)	0.062431969

Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	227	23.97%
0.2	0	23.97%
0.3	97	34.21%
0.4	0	34.21%
0.5	614	99.05%
0.6	1	99.16%
0.7	0	99.16%
0.8	0	99.16%
0.9	0	99.16%
1	1	99.26%
More	7	100.00%

Normal Distribution (95% UCL)

0.39

H = 2.065

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ $((n-1)^{0.5})$] **0.47**

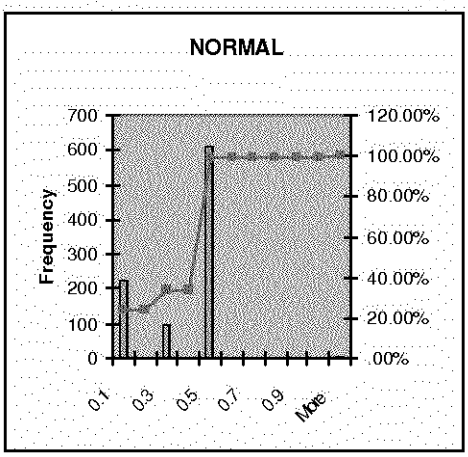
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

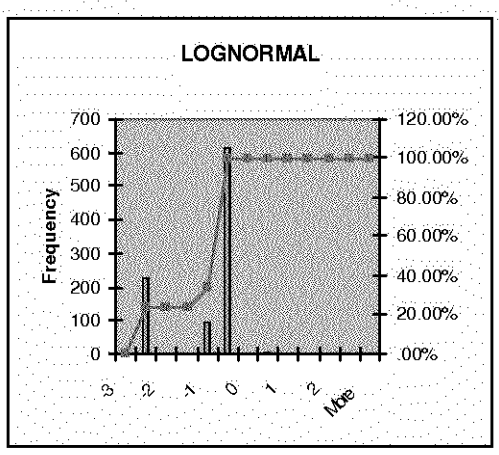
UCL = upper confiedence limit

n = number of samples



Bin Range
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

Bin Range	Frequency	Cumulative %
-3	0	.00%
-2.5	227	23.97%
-2	0	23.97%
-1.5	0	23.97%
-1	97	34.21%
-0.5	615	99.16%
0	1	99.26%
0.5	5	99.79%
1	1	99.89%
1.5	1	100.00%
2	0	100.00%
2.5	0	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Silver
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.251129
D'Agostino Statistic (D) = 0.206641
Significance Statistic (Y) = -77.4351

5% Critical value of -1.796 and 1.485 do not contain -77.4351
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -77.4351
Evidence of non-normality at 99% level of significance

D'Agostino Analysis

Parameter: Silver

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells

Normality Test of Parameter Concentrations

Total Sample Size = 947
Sample Standard Deviation = 0.978989
D'Agostino Statistic (D) = 0.234554
Significance Statistic (Y) = -48.7895

5% Critical value of -1.796 and 1.485 do not contain -48.7895
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -48.7895
Evidence of non-normality at 99% level of significance

THALLIUM

Untransformed		Log Transformed	
Mean	1.440147835	Mean	0.159966881
Standard Error	0.027664419	Standard Error	0.02158529
Median	1.2	Median	0.182321557
Mode	2.5	Mode	0.916290732
Standard Deviation	0.851327268	Standard Deviation	0.664252009
Sample Variance	0.724758118	Sample Variance	0.441230732
Kurtosis	-1.673839719	Kurtosis	-1.606834124
Skewness	0.241905211	Skewness	-0.088487053
Range	2.75	Range	2.48490665
Minimum	0.25	Minimum	-1.386294361
Maximum	3	Maximum	1.098612289
Sum	1363.82	Sum	151.4886363
Count	947	Count	947
Largest(1)	3	Largest(1)	1.098612289
Smallest(1)	0.25	Smallest(1)	-1.386294361
Confidence Level(95.0%)	0.054290754	Confidence Level(95.0%)	0.04236061

Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	0	.00%
0.2	0	.00%
0.3	1	.11%
0.4	0	.11%
0.5	235	24.92%
0.6	30	28.09%
0.7	35	31.78%
0.8	40	36.01%
0.9	39	40.13%
1	49	45.30%
More	518	100.00%

Normal Distribution (95% UCL)

1.49

H = 1.852

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **1.52**

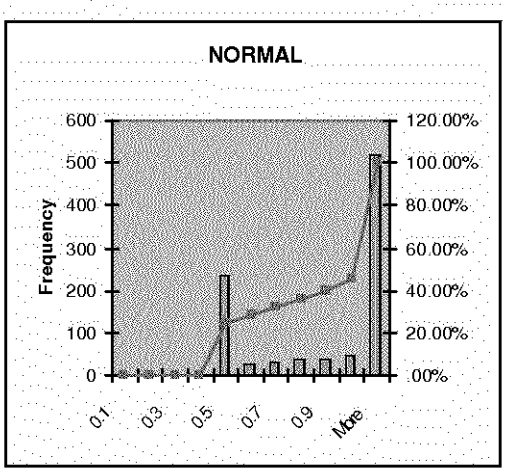
X = mean

s = standard deviation

H = H-statistic (Gilbert 1987)

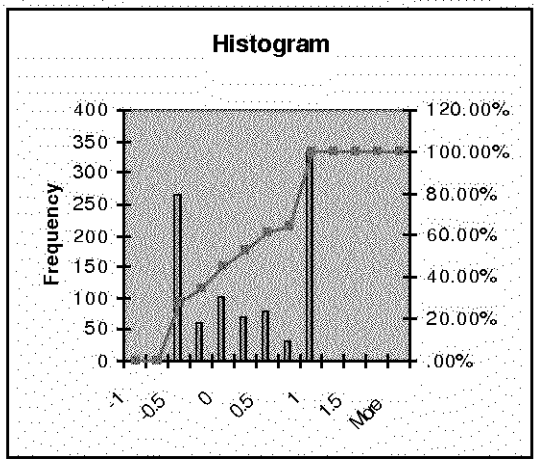
UCL = upper confiedence limit

n = number of samples



Bin Range
-1
-0.75
-0.5
-0.25
0
0.25
0.5
0.75
1
1.25
1.5
1.75

Bin Range	Frequency	Cumulative %
-1	1	.11%
-0.75	0	.11%
-0.5	265	28.09%
-0.25	60	34.42%
0	103	45.30%
0.25	71	52.80%
0.5	79	61.14%
0.75	33	64.63%
1	334	99.89%
1.25	1	100.00%
1.5	0	100.00%
1.75	0	100.00%
More	0	100.00%



D'Agostino Analysis
Parameter: Thallium
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.851327
D'Agostino Statistic (D) = 0.274245
Significance Statistic (Y) = -8.0559

5% Critical value of -1.796 and 1.485 do not contain -8.0559
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -8.0559
Evidence of non-normality at 99% level of significance

D'Agostino Analysis
Parameter: Thallium
Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

All Wells
Normality Test of Parameter Concentrations
Total Sample Size = 947
Sample Standard Deviation = 0.664252
D'Agostino Statistic (D) = 0.278896
Significance Statistic (Y) = -3.28294

5% Critical value of -1.796 and 1.485 do not contain -3.28294
Evidence of non-normality at 95% level of significance
99% Critical value of -2.605 and 2.045 do not contain -3.28294
Evidence of non-normality at 99% level of significance

CYANIDE

Untransformed		Log Transformed	
Mean	0.2485	Mean	-1.39268603
Standard Error	0.0015	Standard Error	0.006391669
Median	0.25	Median	-1.386294361
Mode	0.25	Mode	-1.386294361
Standard Deviation	0.006708204	Standard Deviation	0.028584411
Sample Variance	4.5E-05	Sample Variance	0.000817069
Kurtosis	20	Kurtosis	20
Skewness	-4.472135955	Skewness	-4.472135955
Range	0.03	Range	0.127833372
Minimum	0.22	Minimum	-1.514127733
Maximum	0.25	Maximum	-1.386294361
Sum	4.97	Sum	-27.85372059
Count	20	Count	20
Largest(1)	0.25	Largest(1)	-1.386294361
Smallest(1)	0.22	Smallest(1)	-1.514127733
Confidence Level(95.0%)	0.003139537	Confidence Level(95.0%)	0.01337792

Normal Distribution (95% UCL)

0.25

H = 1.667

Lognormal Distribution (95% UCL)

UCL = e ^ [x + 0.5 s^2 + sH/ ((n-1) $^{0.5}$)] **0.25**

X = mean

s = standard deviation

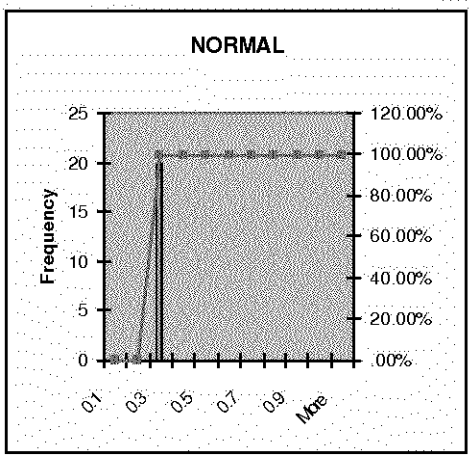
H = H-statistic (Gilbert 1987)

UCL = upper confiedence limit

n = number of samples

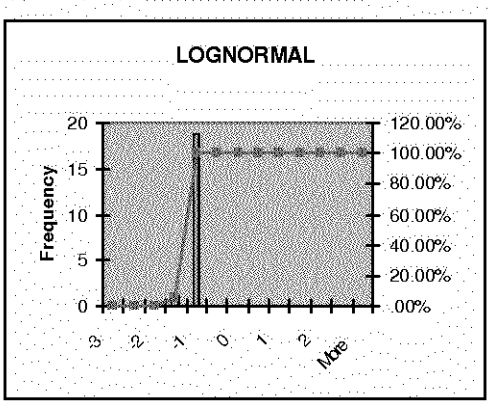
Bin Range
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Bin Range	Frequency	Cumulative %
0.1	0	.00%
0.2	0	.00%
0.3	20	100.00%
0.4	0	100.00%
0.5	0	100.00%
0.6	0	100.00%
0.7	0	100.00%
0.8	0	100.00%
0.9	0	100.00%
1	0	100.00%
More	0	100.00%



Bin Range
-3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

Bin Range	Frequency	Cumulative %
-3	0	.00%
-2.5	0	.00%
-2	0	.00%
-1.5	1	5.00%
-1	19	100.00%
-0.5	0	100.00%
0	0	100.00%
0.5	0	100.00%
1	0	100.00%
1.5	0	100.00%
2	0	100.00%
2.5	0	100.00%
More	0	100.00%



Wilcoxon Rank Sum Test Results

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Arsenic

Compliance

Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 713614
The Expected value is 632945
The Standard Deviation is 15576.6
The Z Score is 5.17884
The Standard Deviation adjusted for ties is 15576.6
The Z Score adjusted for ties is 5.17884
5.17884 > 1.645 indicating possible contamination at 5% significance level
5.17884 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Barium

Compliance

Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 582761
The Expected value is 576940
The Standard Deviation is 14475
The Z Score is 0.402107
The Standard Deviation adjusted for ties is 14475
The Z Score adjusted for ties is 0.402107
0.402107 < 1.645 indicating no contamination at 5% significance level
0.402107 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Beryllium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 601690
The Expected value is 578208
The Standard Deviation is 14497.5
The Z Score is 1.61969
The Standard Deviation adjusted for ties is 14497.5
The Z Score adjusted for ties is 1.61969
1.61969 < 1.645 indicating no contamination at 5% significance level
1.61969 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Cadmium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 666992
The Expected value is 567430
The Standard Deviation is 14305.7
The Z Score is 6.95957
The Standard Deviation adjusted for ties is 14305.7
The Z Score adjusted for ties is 6.95957
6.95957 > 1.645 indicating possible contamination at 5% significance level
6.95957 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Chromium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 569843
The Expected value is 564891
The Standard Deviation is 14240.6
The Z Score is 0.347702
The Standard Deviation adjusted for ties is 14240.6
The Z Score adjusted for ties is 0.347702
0.347702 < 1.645 indicating no contamination at 5% significance level
0.347702 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Cobalt
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 571828
The Expected value is 574404
The Standard Deviation is 14429.9
The Z Score is -0.178553
The Standard Deviation adjusted for ties is 14429.9
The Z Score adjusted for ties is -0.178553
-0.178553 < 1.645 indicating no contamination at 5% significance level
-0.178553 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Copper
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 624041
The Expected value is 590004
The Standard Deviation is 14738.4
The Z Score is 2.30941
The Standard Deviation adjusted for ties is 14738.4
The Z Score adjusted for ties is 2.30941
2.30941 > 1.645 indicating possible contamination at 5% significance level
2.30941 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Lead
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 614382
The Expected value is 514000
The Standard Deviation is 13367.9
The Z Score is 7.50915
The Standard Deviation adjusted for ties is 13367.9
The Z Score adjusted for ties is 7.50915
7.50915 > 1.645 indicating possible contamination at 5% significance level
7.50915 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Mercury
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 648072
The Expected value is 577574
The Standard Deviation is 14486.3
The Z Score is 4.86651
The Standard Deviation adjusted for ties is 14486.3
The Z Score adjusted for ties is 4.86651
4.86651 > 1.645 indicating possible contamination at 5% significance level
4.86651 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Molybdenum
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 600740
The Expected value is 571868
The Standard Deviation is 14384.7
The Z Score is 2.00709
The Standard Deviation adjusted for ties is 14384.7
The Z Score adjusted for ties is 2.00709
2.00709 > 1.645 indicating possible contamination at 5% significance level
2.00709 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Nickel
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 596577
The Expected value is 578208
The Standard Deviation is 14497.5
The Z Score is 1.26701
The Standard Deviation adjusted for ties is 14497.5
The Z Score adjusted for ties is 1.26701
1.26701 < 1.645 indicating no contamination at 5% significance level
1.26701 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Selenium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 804276
The Expected value is 505298
The Standard Deviation is 13190.6
The Z Score is 22.666
The Standard Deviation adjusted for ties is 13190.6
The Z Score adjusted for ties is 22.666
22.666 > 1.645 indicating possible contamination at 5% significance level
22.666 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Silver

Compliance

Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 797098
The Expected value is 575038
The Standard Deviation is 14441.2
The Z Score is 15.3768
The Standard Deviation adjusted for ties is 14441.2
The Z Score adjusted for ties is 15.3768
15.3768 > 1.645 indicating possible contamination at 5% significance level
15.3768 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Thallium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 553689
The Expected value is 368354
The Standard Deviation is 10657.2
The Z Score is 17.3906
The Standard Deviation adjusted for ties is 10657.2
The Z Score adjusted for ties is 17.3906
17.3906 > 1.645 indicating possible contamination at 5% significance level
17.3906 > 1.645 indicating possible contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)
Parameter: Vanadium
Compliance
Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 577048
The Expected value is 577574
The Standard Deviation is 14486.3
The Z Score is -0.0363448
The Standard Deviation adjusted for ties is 14486.3
The Z Score adjusted for ties is -0.0363448
-0.0363448 < 1.645 indicating no contamination at 5% significance level
-0.0363448 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Zinc

Compliance

Original Data (Not Transformed)
Non-Detects Replaced with ½ Detection Limit

The Wilcoxon Statistic is 584452
The Expected value is 566370
The Standard Deviation is 14279.1
The Z Score is 1.26629
The Standard Deviation adjusted for ties is 14279.1
The Z Score adjusted for ties is 1.26629
1.26629 < 1.645 indicating no contamination at 5% significance level
1.26629 < 1.645 indicating no contamination at 5% significance level when adjusted for ties

Calculations of Adjusted PRG and Associated SRA Calculations

SUMMARY OF SCREENING RISK ASSESSMENT RESULTS USING ADJUSTED PRGs
COMMERCIAL/LIGHT INDUSTRIAL SCENARIO
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Pathways: Ingestion of Soil, Dermal Contact with Soil, and Inhalation of Fugitive Dust and Vapors in Outdoor Air						
CAS No.		**Lessor of 95% UCL and Maximum Soil Concentration (mg/kg)**	**California-Adjusted PRG (cancer) (mg/kg)**	**Estimated Excess Lifetime Cancer Risk**	**California-Adjusted PRG (noncancer)**	**Estimated Hazard Quotient**
Volatile Organic Compounds (VOCs)						
67-64-1	Acetone	2.4E-02	na	na	6.2E+03	0.0000039
104-51-8	n-Butylbenzene	8.2E-03	na	na	5.6E+02	0.000015
135-98-8	sec-Butylbenzene	5.4E-03	na	na	4.1E+02	0.000013
98-06-6	tert-Butylbenzene	3.8E-03	na	na	5.1E+02	0.0000075
56-23-5	Carbon tetrachloride	1.8E-03	1.9E-01	9.6E-09	1.1E+02	0.000017
67-66-3	Chloroform	3.6E-03	2.2E+00	1.7E-09	1.3E+00	0.0028
75-71-8	Dichlorodifluoromethane	3.3E-03	na	na	3.1E+02	0.000011
75-34-3	1,1 - Dichloroethane (1,1-DCA)	3.6E-03	na	na	2.0E+03	0.0000018
107-06-2	1,2-Dichloroethane (EDC)	3.5E-03	9.9E-01	3.5E-09	2.7E+03	0.0000013
75-35-4	1,1-Dichloroethylene (1,1-DCE)	4.6E-03	*1.2E-01*	*3.9E-08*	1.5E+02	0.000031
156-59-2	cis-1,2-Dichloroethylene (cis 1,2-DCE)	3.8E-03	na	na	1.5E+02	0.000026
100-41-4	Ethylbenzene	2.9E-02	na	na	1.2E+04	0.0000025
104-76-7	2-Ethyl-1-hexanol (surrogate=butanol)	1.4E+00	na	na	8.6E+04	0.000016
98-82-8	Isopropyl-benzene (cumene, 1-methylethyl benzene)	7.1E-03	na	na	5.2E+02	0.000014
99-87-6	4-Isopropyltoluene (p-isopropyltoluene, p-cymene) (surrogate=isopropyl-benzene)	6.4E-03	na	na	5.2E+02	0.000012
75-09-2	Methylene Chloride	4.4E-03	9.7E+00	4.6E-10	1.5E+03	0.0000030

SUMMARY OF SCREENING RISK ASSESSMENT RESULTS USING ADJUSTED PRGs
COMMERCIAL/LIGHT INDUSTRIAL SCENARIO
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Pathways: Ingestion of Soil, Dermal Contact with Soil, and Inhalation of Fugitive Dust and Vapors in Outdoor Air						
CAS No.		**Lessor of 95% UCL and Maximum Soil Concentration (mg/kg)**	**California-Adjusted PRG (cancer) (mg/kg)**	**Estimated Excess Lifetime Cancer Risk**	**California-Adjusted PRG (noncancer)**	**Estimated Hazard Quotient**
78-93-3	Methyl Ethyl Ketone (2-butanone)	2.8E-02	na	na	1.4E+04	0.0000020
108-10-1	4-Methyl-2-pentanone (MIBK)	2.2E-02	na	na	2.8E+03	0.0000077
1634-04-4	MTBE	3.9E-03	3.7E+01	1.1E-10	na	na
103-65-1	n-Propylbenzene	4.7E-03	na	na	5.6E+02	0.0000083
3405-32-1	1,2,3,4-Tetrachlorobutane (surrogate=1,1,2,2-Tetrachloroethane)	5.6E-01	9.1E-01	6.1E-07	3.9E+03	0.00014
127-18-4	Tetrachloroethylene (PCE)	4.0E-03	2.1E+00	1.9E-09	1.7E+02	0.000024
109-99-9	Tetrahydrofuran	1.7E-02	3.2E+02	5.2E-11	1.9E+05	0.000000091
108-88-3	Toluene	5.9E-03	na	na	1.6E+03	0.0000038
87-61-6	1,2,3-Trichlorobenzene (surrogate=1,2,4-Trichlorobenzene	3.8E-03	na	na	7.5E+03	0.00000051
120-82-1	1,2,4-Trichlorobenzene	4.0E-03	na	na	7.5E+03	0.00000053
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	6.6E-03	na	na	3.2E+03	0.0000020
79-00-5	1,1,2 - TCA	3.5E-03	*1.8E+00*	*1.9E-09*	1.6E+02	0.000022
79-01-6	Trichloroethlyene (TCE)	9.8E-03	3.7E+00	2.7E-09	1.9E+03	0.0000051
95-63-6	1,2,4 - Trimethylbenzene	1.6E-02	na	na	1.7E+02	0.000094
108-67-8	1,3,5 - Trimethylbenzene	6.6E-03	na	na	7.0E+01	0.000094
1330-20-7	Xylenes	2.6E-01	na	na	4.5E+03	0.000058

SUMMARY OF SCREENING RISK ASSESSMENT RESULTS USING ADJUSTED PRGs
COMMERCIAL/LIGHT INDUSTRIAL SCENARIO
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Pathways: Ingestion of Soil, Dermal Contact with Soil, and Inhalation of Fugitive Dust and Vapors in Outdoor Air						
CAS No.		**Lessor of 95% UCL and Maximum Soil Concentration (mg/kg)**	**California-Adjusted PRG (cancer) (mg/kg)**	**Estimated Excess Lifetime Cancer Risk**	**California-Adjusted PRG (noncancer)**	**Estimated Hazard Quotient**
Semi-volatile Organic Compounds (SVOCs)						
117-81-7	Bis(2-ethylhexyl)phthalate	1.4E-01	8.2E+02	1.7E-10	1.8E+04	0.0000079
86-74-8	Carbazole	4.3E-01	1.3E+02	3.4E-09	na	na
132-64-9	Dibenzofuran	1.4E-01	na	na	5.0E+03	0.000028
84-74-2	Di-n-butyl phthalate	1.9E-01	na	na	8.6E+04	0.0000022
123-91-1	1,4-Dioxane	1.4E-02	9.1E+01	1.5E-10	na	na
18-74-1	Hexachlorobenzene	1.2E-01	1.4E+00	8.8E-08	6.9E+02	0.00018
98-95-3	Nitrobenzene	1.4E-01	na	na	1.0E+02	0.0014
594-72-9	1-Nitro-1,1-dichloroethane*	2.7E-01	na	na	na	na
108-95-2	Phenol	1.4E-01	na	na	5.2E+05	0.00000027
Pesticides						
72-54-8	4,4'-DDD	6.1E-03	1.7E+01	3.6E-10	na	na
72-55-9	4,4'-DDE	9.5E-03	1.2E+01	7.8E-10	na	na
50-29-3	4,4'-DDT	4.4E-03	1.2E+01	3.6E-10	7.2E+02	0.0000061
Polychlorinated Biphenyls (PCBs)						
12672-29-6	Aroclor 1248	1.9E-02	4.0E-01	4.8E-08	na	na
11097-69-1	Aroclor 1254	2.1E-02	4.0E-01	5.3E-08	1.4E+01	0.0015
11096-82-5	Aroclor 1260	5.9E-02	4.0E-01	1.5E-07	na	na
Polynuclear Aromatic Hydrocarbons						
83-32-9	Acenaphthene	1.5E-01	na	na	3.8E+04	0.0000039
208-96-8	Acenaphthylene	1.5E-01	na	na	5.4E+04	0.0000028
120-12-7	Anthracene	1.2E-01	na	na	3.9E+05	0.00000031
56-55-3	Benzo(a)anthracene	1.1E-01	1.8E+00	6.2E-08	na	na

SUMMARY OF SCREENING RISK ASSESSMENT RESULTS USING ADJUSTED PRGs
COMMERCIAL/LIGHT INDUSTRIAL SCENARIO
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Pathways: Ingestion of Soil, Dermal Contact with Soil, and Inhalation of Fugitive Dust and Vapors in Outdoor Air						
CAS No.		**Lessor of 95% UCL and Maximum Soil Concentration (mg/kg)**	**California-Adjusted PRG (cancer) (mg/kg)**	**Estimated Excess Lifetime Cancer Risk**	**California-Adjusted PRG (noncancer)**	**Estimated Hazard Quotient**
205-99-2	Benzo(b)fluoranthene	2.8E-01	1.8E+00	1.6E-07	na	na
207-08-9	Benzo(k)fluoranthene	2.7E-01	1.8E+00	1.5E-07	na	na
191-24-2	Benzo(g,h,i)perylene (surrogate=pyrene)	2.1E-01	na	na	5.4E+04	0.0000039
50-3208	Benzo(a)pyrene	2.6E-01	1.8E-01	1.5E-06	na	na
218-01-9	Chrysene	1.2E-01	1.8E+01	6.8E-09	na	na
53-70-3	Dibenzo(a,h)anthracene	9.6E-02	5.2E-01	1.9E-07	na	na
206-44-0	Fluoranthene	1.6E-01	na	na	3.0E+04	0.0000053
86-73-7	Fluorene	1.2E-01	na	na	3.3E+04	0.0000036
193-39-5	Indeno(1,2,3-cd)pyrene	1.9E-01	1.8E+00	1.1E-07	na	na
91-57-6	2-Methylnaphthalene (surrogate=pyrene)	1.7E-01	na	na	5.4E+04	0.0000031
91-20-3	Naphthalene	2.1E-01	na	na	5.6E+02	0.00037
85-01-8	Phenanthrene (surrogate=pyrene)	2.1E-01	na	na	5.4E+04	0.0000039
129-00-0	Pyrene	1.4E-01	na	na	5.4E+04	0.0000026
Metals						
7440-38-2	Arsenic	3.3E+00	2.7E+00	1.2E-06	6.1E+02	0.0054
7440-43-9	Cadmium	3.4E-01	1.3E+03	2.7E-10	5.0E+02	0.00068
18540-29-9	Chromium (hexavalent)	3.1E-01	3.7E+01	8.4E-09	1.0E+04	0.000030
7440-50-8	Copper	2.4E+01	na	na	7.6E+04	0.00032
7439-92-1	Lead	9.8E+00	na	na	na	na
7487-94-7	Mercury	5.0E-02	na	na	6.1E+02	0.000082

SUMMARY OF SCREENING RISK ASSESSMENT RESULTS USING ADJUSTED PRGs
COMMERCIAL/LIGHT INDUSTRIAL SCENARIO
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Pathways: Ingestion of Soil, Dermal Contact with Soil, and Inhalation of Fugitive Dust and Vapors in Outdoor Air						
CAS No.		**Lessor of 95% UCL and Maximum Soil Concentration (mg/kg)**	**California-Adjusted PRG (cancer) (mg/kg)**	**Estimated Excess Lifetime Cancer Risk**	**California-Adjusted PRG (noncancer)**	**Estimated Hazard Quotient**
7439-98-7	Molybdenum	1.0E+00	na	na	1.0E+04	0.00010
7782-49-2	Selenium	6.6E-01	na	na	1.0E+04	0.000066
7440-22-4	Silver	4.7E-01	na	na	1.0E+04	0.000047
7446-18-6	Thallium	1.5E+00	na	na	1.3E+02	0.012
Other Inorganics						
74-90-8	Cyanide (as hydrogen cyanide)	2.2E-01	na	na	1.0E+02	0.0022
TOTAL				**4.4E-06**		**0.027**

* No toxicity data available
na = not applicable
italics - Chemical is classified as an USEPA Class C and/or an IARC Group 3 carcinogen, and is thus, not included in the total risk calculation.

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - CANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - cancer PRGs (mg/kg)				EPA SFi (inh)	EPA SFo (oral)	EPA SFo (dermal)	CA SFi (inh)		CA SFo (oral)		CA SFo (dermal)		Cancer Classification		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)-1			(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	IARC	EPA	PRG - c
Volatile Organic Compounds (VOCs)																	
67-64-1	Acetone	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	D	na
71-36-3	1-Butanol	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	D	na
104-51-8	n-Butylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
135-98-8	sec-Butylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
98-06-6	tert-butylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
56-23-5	Carbon tetrachloride	5.4E-01	4.4E+01	na	5.3E-01	5.25E-02	1.30E-01	1.30E-01	1.50E-01	b	1.50E-01	b	1.50E-01	b	2B	B2	1.9E-01
67-66-3	Chloroform	5.2E-01	9.4E+02	na	5.2E-01	8.05E-02	6.10E-03	6.10E-03	1.90E-02	b	3.10E-02	b	3.10E-02	b	2B	B2	2.2E+00
75-71-8	Dichlorodifluoromethane	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
75-34-3	1,1 - Dichloroethane (1,1-DCA)	na	na	na	na	na	na	na	5.70E-03	b	5.70E-03	b	5.70E-03	b	nc	C	na
107-06-2	1,2-Dichloroethane (EDC)	7.7E-01	6.3E+01	na	7.6E-01	9.10E-02	9.10E-02	9.10E-02	7.00E-02	b	4.70E-02	b	4.70E-02	b	2B	B2	9.9E-01
75-35-4	1,1-Dichloroethylene (1,1-DCE)	1.2E-01	9.5E+00	na	1.2E-01	1.75E-01	6.00E-01	6.00E-01	*1.75E-01*	*a*	*6.00E-01*	*a*	*6.00E-01*	*a*	*3*	*C*	*1.2E-01*
156-59-2	cis-1,2-Dichloroethylene (cis 1,2-DCE)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
100-41-4	Ethylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
104-76-7	2-Ethyl-1-hexanol (surrogate=butanol)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	D	na
98-82-8	Isopropyl-benzene (cumene, 1-methylethyl benzene)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
99-87-6	4-Isopropyltoluene (p-isopropyltoluene, p-cymene) (surrogate=isopropyl-benzene)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
75-09-2	Methylene Chloride	2.1E+01	7.6E+02	na	2.0E+01	1.65E-03	7.50E-03	7.50E-03	3.50E-03	b	1.40E-02	b	1.40E-02	b	2B	B2	9.7E+00
78-93-3	Methyl Ethyl Ketone (2-butanone)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
108-10-1	4-Methyl-2-pentanone (MIBK)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
1634-04-4	MTBE	3.7E+01	3.2E+03	na	3.7E+01	1.80E-03	1.80E-03	na	1.80E-03	b	1.80E-03	b	1.80E-03	b	3	A3	3.7E+01
103-65-1	n-Propylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
3405-32-1	1,2,3,4-Tetrachlorobutane	9.3E-01	2.9E+01	na	9.0E-01	2.03E-01	2.00E-01	na	*2.00E-01*	*b,c*	*2.00E-01*	*a*	*2.00E-01*	*a*	*3*	*C*	*9.1E-01*

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - CANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - cancer PRGs (mg/kg)				EPA SFi (inh)	EPA SFo (oral)	EPA SFo (dermal)	CA SFi (inh)		CA SFo (oral)		CA SFo (dermal)		Cancer Classification		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)-1			(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	IARC	EPA	PRG - c
127-18-4	Tetrachloroethylene (PCE)	2.2E+01	1.1E+02	na	1.8E+01	2.03E-03	5.20E-02	5.20E-02	2.10E-02	b	5.10E-02	b	5.10E-02	b	2A	nc	2.1E+00
109-99-9	Tetrahydrofuran	2.8E+06	7.5E+02	5.7E+02	3.2E+02	6.80E-03	7.60E-03	7.60E-03	6.80E-03	a	7.60E-03	a	7.60E-03	a	nc	nc	3.2E+02
108-88-3	Toluene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
87-61-6	1,2,3-Trichlorobenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
120-82-1	1,2,4-Trichlorobenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
79-00-5	1,1,2 - TCA	1.9E+00	1.0E+02	na	1.9E+00	5.60E-02	5.70E-02	5.70E-02	*5.70E-02*	*b*	*7.20E-02*	*b*	*7.20E-02*	*b*	*3*	*C*	*1.8E+00*
79-01-6	Trichloroethlyene (TCE)	6.2E+00	5.2E+02	na	6.1E+00	6.00E-03	1.10E-02	1.10E-02	1.00E-02	b	1.53E-02	b	1.53E-02	b	2A	nc	3.7E+00
95-63-6	1,2,4 - Trimethylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
108-67-8	1,3,5 - Trimethylbenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
1330-20-7	Xylenes	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
Semi-volatile Organic Compounds (SVOCs)																	
117-81-7	Bis(2-ethylhexyl)phthalate	1.3E+06	4.1E+02	3.1E+02	1.8E+02	1.40E-02	1.40E-02	1.40E-02	8.40E-03	b	3.00E-03	b	3.00E-03	b	2B	B2	8.2E+02
86-74-8	Carbazole	9.4E+05	2.9E+02	2.2E+02	1.3E+02	2.00E-02	2.00E-02	2.00E-02	na	a,b	na	a,b	na	a,b	nc	nc	1.3E+02
132-64-9	Dibenzofuran	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
84-74-2	Di-n-butyl phthalate	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
123-91-1	1,4-Dioxane	1.7E+06	5.2E+02	3.9E+02	2.2E+02	1.10E-02	1.10E-02	1.10E-02	2.70E-02	b	2.70E-02	b	2.70E-02	b	2B	B2	9.1E+01
18-74-1	Hexachlorobenzene	1.2E+04	3.6E+00	2.7E+00	1.5E+00	1.60E+00	1.60E+00	1.60E+00	1.80E+00	b,c	1.80E+00	b,c	1.80E+00	b,c	2B	B2	1.4E+00
98-95-3	Nitrobenzene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	2B	D	na
594-72-9	1-Nitro-1,1-dichloroethane	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
108-95-2	Phenol	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
Pesticides																	
72-54-8	4,4'-DDD	7.8E+04	2.4E+01	6.0E+01	1.7E+01	2.40E-01	2.40E-01	2.40E-01	2.40E-01	b	2.40E-01	b	2.40E-01	b	2B	B2	1.7E+01
72-55-9	4,4'-DDE	5.5E+04	1.7E+01	4.3E+01	1.2E+01	3.40E-01	3.40E-01	3.40E-01	3.40E-01	b	3.40E-01	b	3.40E-01	b	2B	B2	1.2E+01
50-29-3	4,4'-DDT	5.5E+04	1.7E+01	4.3E+01	1.2E+01	3.40E-01	3.40E-01	3.40E-01	3.40E-01	b	3.40E-01	b	3.40E-01	b	2B	B2	1.2E+01
Polychlorinated Biphenyls (PCBs)																	
12672-29-6	Aroclor 1248	9.4E+03	2.9E+00	1.5E+00	9.9E-01	2.00E+00	2.00E+00	2.00E+00	2.00E+00	b	5.00E+00	b	5.00E+00	b	2A	B2	4.0E-01
11097-69-1	Aroclor 1254	9.4E+03	2.9E+00	1.5E+00	9.9E-01	2.00E+00	2.00E+00	2.00E+00	2.00E+00	b	5.00E+00	b	5.00E+00	b	2A	B2	4.0E-01
11096-82-5	Aroclor 1260	9.4E+03	2.9E+00	1.5E+00	9.9E-01	2.00E+00	2.00E+00	2.00E+00	2.00E+00	b	5.00E+00	b	5.00E+00	b	2A	B2	4.0E-01
Polynuclear Aromatic Hydrocarbons																	
83-32-9	Acenaphthene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na

BOE-C6-0001584

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - CANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - cancer PRGs (mg/kg)				EPA SFi (inh)	EPA SFo (oral)	EPA SFo (dermal)	CA SFi (inh)		CA SFo (oral)		CA SFo (dermal)		Cancer Classification		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)-1			(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	(mg/kg-day)-1	Ref.	IARC	EPA	PRG - c
208-96-8	Acenaphthylene (surrogate=pyrene)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
120-12-7	Anthracene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	D	na
56-55-3	Benzo(a)anthracene	6.1E+04	7.8E+00	4.6E+00	2.9E+00	3.10E-01	7.30E-01	7.30E-01	3.90E-01	b	1.20E+00	b	1.20E+00	b	2A	B2	1.8E+00
205-99-2	Benzo(b)fluoranthene	6.1E+04	7.8E+00	4.6E+00	2.9E+00	3.10E-01	7.30E-01	7.30E-01	3.90E-01	b	1.20E+00	b	1.20E+00	b	2B	B2	1.8E+00
207-08-9	Benzo(k)fluoranthene	6.1E+05	7.8E+01	4.6E+01	2.9E+01	3.10E-02	7.30E-02	7.30E-02	3.90E-01	b	1.20E+00	b	1.20E+00	b	2B	B2	1.8E+00
191-24-2	Benzo(g,h,i)perylene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
50-3208	Benzo(a)pyrene	6.1E+03	7.8E-01	4.6E-01	2.9E-01	3.10E+00	7.30E+00	7.30E+00	3.90E+00	b	1.20E+01	b	1.20E+01	b	2A	B2	1.8E-01
218-01-9	Chrysene	6.1E+06	7.8E+02	4.6E+02	2.9E+02	3.10E-03	7.30E-03	7.30E-03	3.90E-02	b	1.20E-01	a,b	1.20E-01	b	3	B2	1.8E+01
53-70-3	Dibenzo(a,h)anthracene	6.1E+03	7.8E-01	4.6E-01	2.9E-01	3.10E+00	7.30E+00	7.30E+00	4.10E+00	b	4.10E+00	b	4.10E+00	b	2A	B2	5.2E-01
206-44-0	Fluoranthene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	D	na
86-73-7	Fluorene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	D	na
193-39-5	Indeno(1,2,3-cd)pyrene	6.1E+04	7.8E+00	4.6E+00	2.9E+00	3.10E-01	7.30E-01	7.30E-01	3.90E-01	b	1.20E+00	b	1.20E+00	b	2B	B2	1.8E+00
91-57-6	2-Methylnaphthalene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
91-20-3	Naphthalene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	C	na
85-01-8	Phenanthrene (surrogate=pyrene)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
129-00-0	Pyrene	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	D	na
Metals																	
7440-38-2	Arsenic	1.3E+03	3.8E+00	9.6E+00	2.7E+00	1.51E+01	1.50E+00	1.50E+00	1.20E+01	b	1.50E+00	b	1.50E+00	b	1	A	2.7E+00
7440-41-7	Beryllium	2.2E+03	na	na	2.2E+03	8.40E+00	na	na	8.40E+00	b	na	a,b	na	a,b	1	B2	2.2E+03
7440-43-9	Cadmium	3.0E+03	na	na	3.0E+03	6.30E+00	na	na	1.50E+01	b	3.80E-01	b	3.80E-01	b	1	B1	1.3E+03
18540-29-9	Chromium (hexavalent)	6.4E+01	na	na	6.4E+01	2.94E+02	na	na	5.10E+02	b	1.90E-01	b	1.90E-01	b	1	A	3.7E+01
7440-50-8	Copper	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
7439-92-1	Lead	na	na	na	na	na	na	na	4.20E-02	b	8.50E-03	b	8.50E-03	b	2B	B2	na
7487-94-7	Mercury	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
7439-98-7	Molybdenum	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
7782-49-2	Selenium	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	3	nc	na
7440-22-4	Silver	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
7446-18-6	Thallium	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na
Other Inorganics																	
74-90-8	Cyanide (as hydrogen cyanide)	na	na	na	na	na	na	na	na	a,b	na	a,b	na	a,b	nc	nc	na

References:

a USEPA Region 9, Preliminary Remediation Goals (PRGs), 2000.

b Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp

c Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, September 13, 2001, http://www.arb.ca.gov/ab2588/riskassess.htm

d Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, 1/22/2001, http://www.oehha.org/air/chronic_rels/AllChrels.html

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - CANCER

Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Toxicity Value Reference Priority:

1. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha/ca.gov/risk/chemicalDB/index.asp
2. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, 1/22/2001, http://www.oehha.org/air/chronic_rels/AllChrels.htm
3. Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, September 13, 2001, http://www.arb.ca.gov/ab2588/riskassess.htm
4. USEPA Region 9, Preliminary Remediation Goals (PRGs), 2000.

IARC/EPA Cancer Classifications:

Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
Cal-EPA OEHHA, Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II Techical Support Document for Describing Available Cancer Potency Factors, April 1999.
USEPA National Center for Environmental Assessment, Integrated Risk Information System (IRIS), www.epa.gov/ngispgm3/iris/index.html
International Agency for Research on Cancer (IARC), IARC Monographs on the Evaluation of Carcinogenic Risk to Humans and their Supplements: A Complete List, www.iarc.fr/
U.S. National Library of Medicine Hazardous Substance Data Bank (HSDB), http://www.nlm.nih.gov/pubs/factsheets/hsdbfs.html

Italics = Either toxity values or physical parameter information is not readily available, or IARC cancer group is 3 and/or USEPA cancer group is C or D (i.e., insufficient toxicological data for assessment of cancer in humans).

Carcinogenic Classifications:

IARC
Group 1: Carcinogenic to humans (sufficient evidence of carcinogenity in humans)
Group 2A: Probably carcinogenic to humans (limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenity in experimental animals)
Group 2B: Possibly carcinogenic to humans (limited evidence in humans in the absense of sufficient evidence in experimental animals, or inadequate evidence of carcinogenicity in humans or when human data are nonexistent but there is sufficient evidence of carcinogenicity in experimental animals)
Group 3: Not classifiable as to its carcinogenicity to humans
Group 4: Probably not carcinogenic to humans (evidence suggesting lack of carcinogenicity in humans together with evidence suggesting lack of carcinogenicity in experimental animals)

USEPA
Group A: Human carcinogen
Group B1: Probable human carcinogen (limited evidence of human carcinogenicity based on epidemiologic studies and sufficient evidence of carcinogenicity based on animals studies)
Group B2: Probable human carcinogen (inadequate or no data for human carcinogenicity and sufficient evidence from animals studies)
Group C: Possible human carcinogen (limited evidence of carcinogenicity in animals in the absence of human data)
Group D: Not classifiable as to human carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data are available)
Group E: Evidence of noncarcinogenicity for humans

Abbreviations:
SFo = Oral slope factor
SFi = Inhalation slope factor

BOE-C6-0001586

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - NONCANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - noncancer PRGs (mg/kg)				EPA Chronic RfDi (inh)	EPA Chronic RfDo (oral)	EPA Chronic RfDo (dermal)	CA Chronic RfDi (inh)		CA Chronic RfDo (oral)		CA Chronic RfDo (dermal)		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)			(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	PRG - nc
Volatile Organic Compounds (VOCs)															
67-64-1	Acetone	6.4E+03	2.0E+05	na	6.2E+03	1.00E-01	1.00E-01	1.00E-01	1.00E-01	a	1.00E-01	a	1.00E-01	a	6.2E+03
71-36-3	1-Butanol	6.7E+08	2.0E+05	1.5E+05	8.6E+04	1.00E-01	1.00E-01	1.00E-01	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	8.6E+04
104-51-8	n-Butylbenzene	5.8E+02	2.0E+04	na	5.6E+02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	b	1.00E-02	a	1.00E-02	a	5.6E+02
135-98-8	sec-Butylbenzene	4.2E+02	2.0E+04	na	4.1E+02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	b	1.00E-02	a	1.00E-02	a	4.1E+02
98-06-6	tert-butylbenzene	5.2E+02	2.0E+04	na	5.1E+02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	b	1.00E-02	a	1.00E-02	a	5.1E+02
56-23-5	Carbon tetrachloride	7.0E+00	1.4E+03	na	7.0E+00	7.00E-04	7.00E-04	7.00E-04	1.14E-02	d	6.86E-04	c	6.86E-04	c	1.1E+02
67-66-3	Chloroform	1.3E+00	2.0E+04	na	1.3E+00	8.57E-02	1.00E-02	1.00E-02	8.57E-02	d	8.57E-02	c	8.57E-02	c	1.3E+00
75-71-8	Dichlorodifluoromethane	3.1E+02	4.1E+05	na	3.1E+02	5.71E-02	2.00E-01	2.00E-01	5.70E-02	a	2.00E-01	a	2.00E-01	a	3.1E+02
75-34-3	1,1 - Dichloroethane (1,1-DCA)	2.1E+03	2.0E+05	na	2.1E+03	1.43E-01	1.00E-01	1.00E-01	1.40E-01	a	1.00E-01	a	1.00E-01	a	2.0E+03
107-06-2	1,2-Dichloroethane (EDC)	3.5E+01	6.1E+04	na	3.5E+01	1.40E-03	3.00E-02	3.00E-02	1.14E-01	d	3.00E-02	a	3.00E-02	a	2.7E+03
75-35-4	1,1-Dichloroethylene (1,1-DCE)	6.8E+01	1.8E+04	na	6.8E+01	9.00E-03	9.00E-03	9.00E-03	2.00E-02	d	9.00E-03	a	9.00E-03	a	1.5E+02
156-59-2	cis-1,2-Dichloroethylene (cis 1,2-DCE)	1.5E+02	2.0E+04	na	1.5E+02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	a	1.00E-02	a	1.00E-02	a	1.5E+02
100-41-4	Ethylbenzene	6.2E+03	2.0E+05	na	6.0E+03	2.90E-01	1.00E-01	1.00E-01	5.71E-01	d	1.00E-01	a	1.00E-01	a	1.2E+04
104-76-7	2-Ethyl-1-hexanol (surrogate=butanol)	6.7E+08	2.0E+05	1.5E+05	8.6E+04	1.00E-01	1.00E-01	1.00E-01	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	8.6E+04
98-82-8	Isopropyl-benzene (cumene, 1-methyl ethyl benzene)	5.2E+02	2.0E+05	na	5.2E+02	1.10E-01	1.00E-01	1.00E-01	1.10E-01	a	1.00E-01	a	1.00E-01	a	5.2E+02
99-87-6	4-Isopropyltoluene (p-isopropyltoluene, p-cymene) (surrogate=isopropyl-benzene)	5.2E+02	2.0E+05	na	5.2E+02	1.10E-01	1.00E-01	1.00E-01	1.10E-01	a	1.00E-01	a	1.00E-01	a	5.2E+02
75-09-2	Methylene Chloride	1.1E+04	1.2E+05	na	1.0E+04	8.57E-01	6.00E-02	6.00E-02	1.14E-01	d	1.14E-01	c	6.00E-02	a	1.5E+03
78-93-3	Methyl Ethyl Ketone (2-butanone)	2.8E+04	1.2E+06	na	2.7E+04	2.86E-01	6.00E-01	6.00E-01	1.43E-01	b	6.00E-01	a	6.00E-01	a	1.4E+04
108-10-1	4-Methyl-2-pentanone (MIBK)	2.9E+03	1.6E+05	na	2.8E+03	2.29E-02	8.00E-02	8.00E-02	2.29E-02	a	8.00E-02	a	8.00E-02	a	2.8E+03
1634-04-4	MTBE	na	na	na	na	8.57E-01	na	na	2.29E+00	d	na	a,b,c,d	na	a,b,c,d	na
103-65-1	n-Propylbenzene	5.8E+02	2.0E+04	na	5.6E+02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	b	1.00E-02	a	1.00E-02	a	5.6E+02

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - NONCANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - noncancer PRGs (mg/kg)				EPA Chronic RfDi (inh)	EPA Chronic RfDo (oral)	EPA Chronic RfDo (dermal)	CA Chronic RfDi (inh)		CA Chronic RfDo (oral)		CA Chronic RfDo (dermal)		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)			(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	PRG - nc
3405-32-1	1,2,3,4-Tetrachlorobutane	4.0E+03	1.2E+05	na	3.9E+03	6.00E-02	6.00E-02	6.00E-02	6.00E-02	a	6.00E-02	a	6.00E-02	a	3.9E+03
127-18-4	Tetrachloroethylene (PCE)	1.9E+03	2.0E+04	na	1.7E+03	1.14E-01	1.00E-02	1.00E-02	1.00E-02	d	1.00E-02	a	1.00E-02	a	1.7E+02
109-99-9	Tetrahydrofuran	5.8E+08	4.3E+05	3.3E+05	1.9E+05	8.57E-02	2.10E-01	2.10E-01	8.57E-02	a	2.10E-01	a	2.10E-01	a	1.9E+05
108-88-3	Toluene	2.0E+03	4.1E+05	na	2.0E+03	1.10E-01	2.00E-01	2.00E-01	8.57E-02	d	2.00E-01	a	2.00E-01	a	1.6E+03
87-61-6	1,2,3-Trichlorobenzene	1.2E+04	2.0E+04	na	7.5E+03	5.70E-02	1.00E-02	1.00E-02	5.70E-02	a	1.00E-02	a	1.00E-02	a	7.5E+03
120-82-1	1,2,4-Trichlorobenzene	1.2E+04	2.0E+04	na	7.5E+03	5.70E-02	1.00E-02	1.00E-02	5.70E-02	a	1.00E-02	a	1.00E-02	a	7.5E+03
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	3.5E+03	4.1E+04	na	3.2E+03	2.86E-01	2.00E-02	2.00E-02	2.86E-01	d	2.00E-02	a	2.00E-02	a	3.2E+03
79-00-5	1,1,2 - TCA	1.6E+02	8.2E+03	na	1.6E+02	4.00E-03	4.00E-03	4.00E-03	4.00E-03	a	4.00E-03	a	4.00E-03	a	1.6E+02
79-01-6	Trichloroethlyene (TCE)	8.0E+01	1.2E+04	na	7.9E+01	6.00E-03	6.00E-03	6.00E-03	1.71E-01	d	6.00E-03	a	6.00E-03	a	1.9E+03
95-63-6	1,2,4 - Trimethylbenzene	1.7E+02	1.0E+05	na	1.7E+02	1.70E-03	5.00E-02	5.00E-02	1.70E-03	a	5.00E-02	a	5.00E-02	a	1.7E+02
108-67-8	1,3,5 - Trimethylbenzene	7.0E+01	1.0E+05	na	7.0E+01	1.70E-03	5.00E-02	5.00E-02	1.70E-03	a	5.00E-02	a	5.00E-02	a	7.0E+01
1330-20-7	Xylenes	4.5E+03	4.1E+06	3.1E+06	4.5E+03	2.00E-01	2.00E+00	2.00E+00	2.00E-01	d	2.00E+00	a	2.00E+00	a	4.5E+03
Semi-volatile Organic Compounds (SVOCs)															
117-81-7	Bis(2-ethylhexyl)phthalate	1.5E+08	4.1E+04	3.1E+04	1.8E+04	2.20E-02	2.00E-02	2.00E-02	2.00E-02	c	2.00E-02	a	2.00E-02	a	1.8E+04
86-74-8	Carbazole	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
132-64-9	Dibenzofuran	1.3E+04	8.2E+03	na	5.0E+03	4.00E-03	4.00E-03	4.00E-03	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	5.0E+03
84-74-2	Di-n-butyl phthalate	6.7E+08	2.0E+05	1.5E+05	8.6E+04	1.00E-01	1.00E-01	1.00E-01	1.00E-01	a	1.00E-01	a	1.00E-01	a	8.6E+04
123-91-1	1,4-Dioxane	na	na	na	na	na	na	na	8.6E-01	c	na	a,b,c	na	a,b,c	na
18-74-1	Hexachlorobenzene	5.4E+06	1.6E+03	1.2E+03	6.9E+02	8.00E-04	8.00E-04	8.00E-04	8.0E-04	c	8.0E-04	c	8.0E-04	c	6.9E+02
98-95-3	Nitrobenzene	1.3E+02	1.0E+03	na	1.2E+02	5.71E-04	5.00E-04	5.00E-04	4.86E-04	c	5.00E-04	a	5.00E-04	a	1.0E+02
594-72-9	1-Nitro-1,1-dichloroethane	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
108-95-2	Phenol	4.0E+09	1.2E+06	9.3E+05	5.2E+05	6.00E-01	6.00E-01	6.00E-01	5.7E-02	d	6.00E-01	a	6.00E-01	a	5.2E+05
Pesticides															
72-54-8	4,4'-DDD	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
72-55-9	4,4'-DDE	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
50-29-3	4,4'-DDT	3.4E+06	1.0E+03	2.6E+03	7.2E+02	5.00E-04	5.00E-04	5.00E-04	5.00E-04	a	5.00E-04	a	5.00E-04	a	7.2E+02

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - NONCANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - noncancer PRGs (mg/kg)				EPA Chronic RfDi (inh)	EPA Chronic RfDo (oral)	EPA Chronic RfDo (dermal)	CA Chronic RfDi (inh)		CA Chronic RfDo (oral)		CA Chronic RfDo (dermal)		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)			(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	PRG - nc
Polychlorinated Biphenyls (PCBs)															
53469-21-9	Aroclor 1242	na	na	na	na	na	na	na	3.4E-04	c	2.00E-05	c	2.00E-05	c	na
12672-29-6	Aroclor 1248	na	na	na	na	na	na	na	3.4E-04	c	2.00E-05	c	2.00E-05	c	na
11097-69-1	Aroclor 1254	1.3E+05	4.1E+01	2.2E+01	1.4E+01	2.00E-05	2.00E-05	2.00E-05	3.4E-04	c	2.00E-05	c	2.00E-05	c	1.4E+01
11096-82-5	Aroclor 1260	na	na	na	na	na	na	na	3.4E-04	c	2.00E-05	c	2.00E-05	c	na
Polynuclear Aromatic Hydrocarbons															
83-32-9	Acenaphthene	5.6E+04	1.2E+05	na	3.8E+04	6.00E-02	6.00E-02	6.00E-02	6.00E-02	a	6.00E-02	a	6.00E-02	a	3.8E+04
208-96-8	Acenaphthylene (surrogate=pyrene)	4.7E+05	6.1E+04	na	5.4E+04	3.00E-02	3.00E-02	3.00E-02	3.00E-02	a	3.00E-02	a	3.00E-02	a	5.4E+04
120-12-7	Anthracene	1.1E+06	6.1E+05	na	3.9E+05	3.00E-01	3.00E-01	3.00E-01	3.00E-01	a	3.00E-01	a	3.00E-01	a	3.9E+05
56-55-3	Benzo(a)anthracene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
205-99-2	Benzo(b)fluoranthene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
207-08-9	Benzo(k)fluoranthene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
191-24-2	Benzo(g,h,i)perylene (as Pyrene)	4.7E+05	6.1E+04	na	5.4E+04	3.00E-02	3.00E-02	3.00E-02	3.00E-02	a	3.00E-02	a	3.00E-02	a	5.4E+04
50-3208	Benzo(a)pyrene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
218-01-9	Chrysene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
53-70-3	Dibenzo(a,h)anthracene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
206-44-0	Fluoranthene	2.7E+08	8.2E+04	4.8E+04	3.0E+04	4.00E-02	4.00E-02	4.00E-02	4.00E-02	a	4.00E-02	a	4.00E-02	a	3.0E+04
86-73-7	Fluorene	5.6E+04	8.2E+04	na	3.3E+04	4.00E-02	4.00E-02	4.00E-02	4.00E-02	a	4.00E-02	a	4.00E-02	a	3.3E+04
193-39-5	Indeno(1,2,3-cd)pyrene	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na
91-57-6	2-Methylnaphthalene (as Pyrene)	4.7E+05	6.1E+04	na	5.4E+04	3.00E-02	3.00E-02	3.00E-02	3.00E-02	a	3.00E-02	a	3.00E-02	a	5.4E+04
91-20-3	Naphthalene	1.9E+02	4.1E+04	na	1.9E+02	8.57E-04	2.00E-02	2.00E-02	2.57E-03	d	2.00E-02	a	2.00E-02	a	5.6E+02
85-01-8	Phenanthrene (surrogate=pyrene)	na	na	na	na	na	na	na	3.00E-02	a	3.00E-02	a	3.00E-02	a	na
129-00-0	Pyrene	4.7E+05	6.1E+04	na	5.4E+04	3.00E-02	3.00E-02	3.00E-02	3.00E-02	a	3.00E-02	a	3.00E-02	a	5.4E+04
Metals															
7440-38-2	Arsenic	na	6.1E+02	1.5E+03	4.3E+02	na	3.00E-04	3.00E-04	8.57E-06	d	3.00E-04	c	3.00E-04	c	6.1E+02
7440-43-9	Cadmium	na	1.0E+03	3.9E+03	8.0E+02	na	5.00E-04	5.00E-04	5.71E-06	d	1.00E-03	c	1.00E-03	c	5.0E+02
18540-29-9	Chromium (hexavalent)	na	6.1E+03	na	6.1E+03	na	3.00E-03	3.00E-03	5.71E-05	d	5.00E-03	c	5.00E-03	c	1.0E+04
7440-50-8	Copper	na	7.6E+04	na	7.6E+04	na	3.71E-02	3.71E-02	6.86E-04	c	3.71E-02	a	3.71E-02	a	7.6E+04
7439-92-1	Lead	na	na	na	na	na	na	na	na	a,b,c,d	na	a,b,c,d	na	a,b,c,d	na

DERIVATION OF CALIFORNIA-ADJUSTED PRELIMINARY REMEDIATION GOALS (PRGS) - NONCANCER

Boeing Realty Corporation Former C-6 Facility

Parcel C

Los Angeles, California

CAS No.		EPA Industrial - noncancer PRGs (mg/kg)				EPA Chronic RfDi (inh)	EPA Chronic RfDo (oral)	EPA Chronic RfDo (dermal)	CA Chronic RfDi (inh)		CA Chronic RfDo (oral)		CA Chronic RfDo (dermal)		CA-adjusted Industrial
		inh	ingest	dermal	combined	(mg/kg-day)			(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	(mg/kg-day)	Ref.	PRG - nc
7487-94-7	Mercury	na	6.1E+02	na	6.1E+02	na	3.00E-04	3.00E-04	2.57E-05	d	3.00E-04	c	3.00E-04	c	6.1E+02
7439-98-7	Molybdenum	na	1.0E+04	na	1.0E+04	na	5.00E-03	5.00E-03	na	a,b,c,d	5.00E-03	a	5.00E-03	a	1.0E+04
7782-49-2	Selenium	na	1.0E+04	na	1.0E+04	na	5.00E-03	5.00E-03	1.43E-04	c	5.00E-03	a	5.00E-03	a	1.0E+04
7440-22-4	Silver	na	1.0E+04	na	1.0E+04	na	5.00E-03	5.00E-03	na	a,b,c,d	5.00E-03	a	5.00E-03	a	1.0E+04
7446-18-6	Thallium	na	1.3E+02	na	1.3E+02	na	6.60E-05	6.60E-05	na	a,b,c,d	6.60E-05	a	6.60E-05	a	1.3E+02
Other Inorganics															
74-90-8	Cyanide (as hydrogen cyanide)	3.50E+01	4.10E+04	na	3.50E+01	8.57E-04	2.00E-02	2.00E-02	2.57E-03	b,c,d	2.00E-02	a	2.00E-02	a	1.00E+02

References:

a USEPA Region 9, Preliminary Remediation Goals (PRGs), 2000.
b Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha.ca.gov/risk/chemicalDB/index.asp
c Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, September 13, 2001, http://www.arb.ca.gov/ab2588/riskassess.htm
d Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, 1/22/2001, http://www.oehha.org/air/chronic_rels/AllChrels.html

Toxicity Value Reference Priority:
1. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Toxicity Criteria Database and March 2001 California Cancer Potency Values, http://www.oehha/ca.gov/risk/chemicalDB/index.asp
2. Cal-EPA Office of Environmental Health Hazard Assessment (OEHHA), Chronic Reference Exposure Levels (RELs) for Airborne Toxicants, 1/22/2001, http://www.oehha.org/air/chronic_rels/AllChrels.htm
3. Cal-EPA, Air Resources Board (ARB), Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, September 13, 2001, http://www.arb.ca.gov/ab2588/riskassess.htm
4. USEPA Region 9, Preliminary Remediation Goals (PRGs), 2000.

Abbreviations:
RfDo = Oral reference dose
RfDi = Inhalation reference dose

Calculations of Risk from Inhalation of Organic Vapors in On-grade Commercial Structures

SUMMARY OF VAPOR PHASE MIGRATION RISK ASSESSMENT RESULTS
ON-GRADE COMMERCIAL STRUCTURE
Boeing Realty Corporation Fomer C-6 Facility, Parcel C
Los Angeles, California

CAS No.		Maximum Soil Gas Concentration (ug/l or mg/m3)	Maximum Soil Concentration (mg/kg)	Maximum Groundwater Concentration (ug/l)	Estimated Excess Lifetime Cancer Risk	Estimated Hazard Quotient
Volatile Organic Compounds						
67-64-1	*Acetone*		2.8		No Slope Factor	0.0014
67-64-1	*Acetone*			6.5	No Slope Factor	0.0000000041
104-51-8	*n-Butylbenzene*		0.69		No Slope Factor	0.038
135-98-8	*sec-Butylbenzene*		0.32		No Slope Factor	0.031
98-06-6	*tert-Butylbenzene*		0.034		No Slope Factor	0.0022
67-66-3	Chloroform	3			4.0E-09	0.0000074
75-34-3	1,1-Dichloroethane (1,1-DCA)	6			1.8E-09	0.0000067
107-06-2	1,1-Dichloroethylene (1,1-DCE)	79			8.8E-07	0.00076
156-59-2	cis-1,2-Dichloroethylene (cis-1,2-DCE)	8			No Slope Factor	0.00013
104-76-7	*2-ethyl-1-hexanol*		1.4		No Slope Factor	0.00010
591-78-6	*2-Hexanone (surrogate=MIBK)*		0.014		3.9E-09	0.0000028
98-82-8	*Isopropyl-benzene (cumene, 1-*		0.098		No Slope Factor	0.025
99-87-6	*4-Isopropyltoluene (p-isopropyltoluene, p-cymene) - (as*		0.48		No Slope Factor	0.12
78-93-3	*Methyl Ethyl Ketone (2-butanone) (at 60 feet bgs)**		8,700		No Slope Factor	0.012
78-93-3	*Methyl Ethyl Ketone (2-butanone)*			18,000	No Slope Factor	0.0000041
108-10-1	*4-Methyl-2-pentanone (MIBK) (at 60 feet bgs)**		1,300		No Slope Factor	0.028
108-10-1	*4-Methyl-2-pentanone (MIBK)*			3,100	No Slope Factor	0.000019
1634-04-4	*MTBE*		0.021		5.9E-09	0.0000043
1795-15-9	*1-Octyl cyclohexane (surrogate=ethylbenzene)*		0.011		No Slope Factor	0.00000040
103-65-1	*n-Propylbenzene (1,4-DCB)*		0.33		No Slope Factor	0.018
100-42-5	*Styrene*			0.64	No Slope Factor	0.0000000064
3405-32-1	*1,2,3,4-Tetrachlorobutane (surrogate=1,1,2,2-*		0.56		6.3E-06	0.0016
127-18-4	Tetrachloroethylene (PCE)	25			2.7E-08	0.00038
108-88-3	Toluene	7			No Slope Factor	0.000015
87-61-6	*1,2,3-Trichlorobenzene (surrogate=1,2,4-Trichlorobenzene)*		0.0039		No Slope Factor	0.0000026
120-82-1	*1,2,4-Trichlorobenzene*		0.004		No Slope Factor	0.0000027
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	6			No Slope Factor	0.0000035
79-01-6	Trichloroethlyene (TCE)	275			1.5E-07	0.00027
75-69-4	Trichlorofluoromethane (Freon 11)	4			No Slope Factor	0.0000037
95-63-6	*1,2,4 - Trimethylbenzene*		1.9		No Slope Factor	0.20
95-63-6	*1,2,4 - Trimethylbenzene*			0.47	No Slope Factor	0.0000016

SUMMARY OF VAPOR PHASE MIGRATION RISK ASSESSMENT RESULTS
ON-GRADE COMMERCIAL STRUCTURE
Boeing Realty Corporation Fomer C-6 Facility, Parcel C
Los Angeles, California

CAS No.		Maximum Soil Gas Concentration (ug/l or mg/m3)	Maximum Soil Concentration (mg/kg)	Maximum Groundwater Concentration (ug/l)	Estimated Excess Lifetime Cancer Risk	Estimated Hazard Quotient
108-67-8	*1,3,5 - Trimethylbenzene*		0.68		No Slope Factor	0.39
108-67-8	*1,3,5 - Trimethylbenzene*			0.34	No Slope Factor	0.0000016
1330-20-7	Xylenes	13			No Slope Factor	0.000010
TOTAL					**2.0E-07**	**0.87**

italics - Chemicals not analyzed in soil gas, but were detected in soil and/or groundwater samples. Risk evaluated using maximum soil and/or groundwater sample concentrations.

Note - Estimated excess lifetime cancer risk for 1,1-Dichloroethene and 1,2,3,4-Tetrachlorobutane not included in the total excess lifetime risk calculation; since, it is a USEPA Class C carcinogen and an IARC Group 3 carcinogen.

Note - 1,2,3-Trichloropropane was detected in one sample of 1,540 samples tested, at an estimated concentration. Due to the low frequency of detection and that the one detected concentation was an estimated value, this chemical was not included as a COPC.

Note - Tetrahydrofuran is not identified as a VOC in the USEPA Region 9 PRG documentation, and is, thus, not included in the calculation of risk due to inhalation of indoor air.

* For the chemicals detected in soil and groundwater but not tested for in soil gas, the vapor model was run for the maximum concentration at each sampling depth and for groundwater. The higher of the estimated risks at each soil depth and groundwater were included in the estimate of total risk.

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Acetone

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	5.80E+04	mg/mole
Vapor pressure	VP	=	3.04E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.60E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	2.80E+00	mg/kg
Henry's Law Constant	H	=	1.60E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	5.80E-01	cm3/gm
Soil/water distribution coef.	K_d	=	**6.05E-04**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.67E+01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.67E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	1.20E-01	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.68E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.06E-01**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**8.71E-04**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**8.71E-04**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**4.54E-05**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.36E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.36E-04	mg/kg-day
Reference dose	RfD	=	1.00E-01	mg/kg-day
Hazard Index	**HI**	=	**1.36E-03**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	4.54E-05	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Acetone

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	5.80E+04	mg/mole
Vapor pressure	VP	=	3.04E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	6.50E+00	ug/l
Henry's Law Constant	H	=	1.60E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**1.04E-02**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.90E-01	mg/kg
Henry's Law Constant	H	=	1.60E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	5.80E-01	cm3/gm
Soil/water distribution coef.	K_d	=	**6.05E-04**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**6.58E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.04E-02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	1.20E-01	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.68E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**3.18E-07**	**mg/m2-hour**

BOE-C6-0001596

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**2.61E-09**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**2.61E-09**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.36E-10**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**4.08E-10**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	4.08E-10	mg/kg-day
Reference dose	RfD	=	1.00E-01	mg/kg-day
Hazard Index	**HI**	=	**4.08E-09**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.36E-10	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001597

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-Butylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	1.32E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.96E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	5.40E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.90E-01	mg/kg
Henry's Law Constant	H	=	5.40E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.80E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**2.92E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**1.19E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.19E+02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**2.95E-01**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**2.41E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**2.41E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.26E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**3.78E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	3.78E-04	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**3.78E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.26E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: sec-Butylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	1.45E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	7.70E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	3.20E-01	mg/kg
Henry's Law Constant	H	=	7.70E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.20E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**2.29E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**9.69E+01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 9.69E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**2.41E-01**	**mg/m2-hour**

BOE-C6-0001600

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.97E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.97E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.03E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**3.09E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	3.09E-04	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**3.09E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.03E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001601

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: tert-Butylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	2.89E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	0.00E+00	ug/l
Henry's Law Constant	H	=	5.20E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	3.40E-02	mg/kg
Henry's Law Constant	H	=	5.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.20E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**2.29E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**7.03E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 7.03E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.75E-02**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.43E-04**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.43E-04**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**7.47E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**2.24E-05**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	2.24E-05	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**2.24E-03**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	7.47E-06	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001603

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Chloroform

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	2.59E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.50E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	0.00E+00	mg/kg
Henry's Law Constant	H	=	1.50E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	5.30E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**5.53E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**3.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 3.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	1.00E-01	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.40E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**4.97E-04**	**mg/m2-hour**

BOE-C6-0001604

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**4.07E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**4.07E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**2.13E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**6.38E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	6.38E-07	mg/kg-day
Reference dose	RfD	=	8.57E-02	mg/kg-day
Hazard Index	**HI**	=	**7.44E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	2.13E-07	mg/kg-day
Slope factor (potency)	SF	=	1.90E-02	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**4.04E-09**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1 - Dichloroethane (1,1-DCA)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	9.90E+04	mg/mole
Vapor pressure	VP	=	3.08E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	2.30E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.90E-01	mg/kg
Henry's Law Constant	H	=	2.30E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	5.30E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**5.53E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**6.43E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**6.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 6.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.40E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.04E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**7.36E-04**	**mg/m2-hour**

BOE-C6-0001606

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**6.03E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**6.03E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**3.15E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**9.44E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	9.44E-07	mg/kg-day
Reference dose	RfD	=	1.40E-01	mg/kg-day
Hazard Index	**HI**	=	**6.74E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	3.15E-07	mg/kg-day
Slope factor (potency)	SF	=	5.70E-03	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**1.79E-09**	

BOE-C6-0001607

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1-Dichloroethylene (1,1-DCE)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	9.70E+04	mg/mole
Vapor pressure	VP	=	7.78E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.10E+00	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.90E-01	mg/kg
Henry's Law Constant	H	=	1.10E+00	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	6.50E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**6.78E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.15E+03**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**7.90E+01**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 7.90E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	9.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.26E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**1.18E-02**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**9.65E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**9.65E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**5.04E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.51E-05**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.51E-05	mg/kg-day
Reference dose	RfD	=	2.00E-02	mg/kg-day
Hazard Index	**HI**	=	**7.56E-04**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	5.04E-06	mg/kg-day
Slope factor (potency)	SF	=	1.75E-01	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**8.82E-07**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: cis-1,2-Dichloroethylene (cis 1,2-DCE)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	9.70E+04	mg/mole
Vapor pressure	VP	=	2.40E-04	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.70E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.90E-01	mg/kg
Henry's Law Constant	H	=	1.70E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	3.60E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**3.75E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**5.27E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**8.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 8.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.40E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.04E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**9.81E-04**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**8.04E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**8.04E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**4.20E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.26E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.26E-06	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**1.26E-04**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	4.20E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001611

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 2-Ethyl-1-hexanol (surrogate=butanol)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	1.80E-04	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	3.60E-04	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	1.40E+00	mg/kg
Henry's Law Constant	H	=	3.60E-04	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	6.92E+00	cm3/gm
Soil/water distribution coef.	K_d	=	**7.21E-03**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.89E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**		**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.89E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	8.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.12E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**7.67E-03**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**6.29E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**6.29E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**3.28E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**9.84E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	9.84E-06	mg/kg-day
Reference dose	RfD	=	1.00E-01	mg/kg-day
Hazard Index	**HI**	=	**9.84E-05**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	3.28E-06	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001613

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 2-Hexanone (surrogate=MIBK)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.00E+05	mg/mole
Vapor pressure	VP	=	3.29E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	2.40E-02	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	1.40E-02	mg/kg
Henry's Law Constant	H	=	2.40E-02	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	6.00E+00	cm3/gm
Soil/water distribution coef.	K_d	=	**6.26E-03**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**1.91E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.91E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	8.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.12E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**5.07E-03**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**4.15E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**4.15E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**2.17E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**6.50E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	6.50E-06	mg/kg-day
Reference dose	RfD	=	2.29E+00	mg/kg-day
Hazard Index	**HI**	=	**2.85E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	2.17E-06	mg/kg-day
Slope factor (potency)	SF	=	1.80E-03	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**3.90E-09**	

BOE-C6-0001615

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Isopropyl-benzene (cumene, 1-methyethyl benzene)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	5.92E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	4.90E+01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	9.80E-02	mg/kg
Henry's Law Constant	H	=	4.90E+01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**2.29E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**8.48E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 8.48E+02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**2.11E+00**	**mg/m2-hour**

BOE-C6-0001616

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.73E-02**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.73E-02**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**9.01E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**2.70E-03**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	2.70E-03	mg/kg-day
Reference dose	RfD	=	1.10E-01	mg/kg-day
Hazard Index	**HI**	=	**2.46E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	9.01E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001617

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 4-Isopropyltoluene (p-isopropyltoluene, p-cymene) - (as isopropyl-benzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.34E+05	mg/mole
Vapor pressure	VP	=	1.97E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	4.90E+01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	4.80E-01	mg/kg
Henry's Law Constant	H	=	4.90E+01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**2.29E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**4.15E+03**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 4.15E+03 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.03E+01**	**mg/m2-hour**

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**8.46E-02**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**8.46E-02**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**4.42E-03**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.32E-02**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.32E-02	mg/kg-day
Reference dose	RfD	=	1.10E-01	mg/kg-day
Hazard Index	**HI**	=	**1.20E-01**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	4.42E-03	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001619

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Methyl Ethyl Ketone

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	7.20E+04	mg/mole
Vapor pressure	VP	=	1.20E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.10E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	8.70E+03	mg/kg
Henry's Law Constant	H	=	1.10E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	4.50E+00	cm3/gm
Soil/water distribution coef.	K_d	=	**4.69E-03**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**5.57E+04**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 5.57E+04 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	9.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.26E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.83E+01	m
Calculated Flux	**F_x**	**=**	**1.39E+00**	**mg/m2-hour**

BOE-C6-0001620

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.14E-02**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.14E-02**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**5.92E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.78E-03**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.78E-03	mg/kg-day
Reference dose	RfD	=	1.43E-01	mg/kg-day
Hazard Index	**HI**	=	**1.24E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	5.92E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001621

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Methyl Ethyl Ketone

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	7.20E+04	mg/mole
Vapor pressure	VP	=	1.20E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	1.80E+04	ug/l
Henry's Law Constant	H	=	1.10E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**1.98E+01**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	1.10E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	4.50E+00	cm3/gm
Soil/water distribution coef.	K_d	=	**4.69E-03**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.98E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	9.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.26E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**4.54E-04**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**3.72E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**3.72E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.94E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**5.83E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	5.83E-07	mg/kg-day
Reference dose	RfD	=	1.43E-01	mg/kg-day
Hazard Index	**HI**	=	**4.08E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.94E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001623

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 4-Methyl-2-pentanone (MIBK)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.00E+05	mg/mole
Vapor pressure	VP	=	2.62E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	5.70E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	1.30E+03	mg/kg
Henry's Law Constant	H	=	5.70E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.30E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**1.36E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.45E+04**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.45E+04 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.83E+01	m
Calculated Flux	**F_x**	**=**	**5.06E-01**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**4.15E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**4.15E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**2.17E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**6.50E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	6.50E-04	mg/kg-day
Reference dose	RfD	=	2.29E-02	mg/kg-day
Hazard Index	**HI**	=	**2.84E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	2.17E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001625

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 4-Methyl-2-pentanone (MIBK)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.00E+05	mg/mole
Vapor pressure	VP	=	2.62E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	3.10E+03	ug/l
Henry's Law Constant	H	=	5.70E-03	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**1.77E+01**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	5.70E-03	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.30E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**1.36E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.77E+01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**3.38E-04**	**mg/m2-hour**

BOE-C6-0001626

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**2.77E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**2.77E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.44E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**4.33E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	4.33E-07	mg/kg-day
Reference dose	RfD	=	2.29E-02	mg/kg-day
Hazard Index	**HI**	=	**1.89E-05**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.44E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001627

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: MTBE

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	8.50E+04	mg/mole
Vapor pressure	VP	=	3.29E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	0.00E+00	ug/l
Henry's Law Constant	H	=	2.40E-02	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	2.10E-02	mg/kg
Henry's Law Constant	H	=	2.40E-02	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	6.00E+00	cm3/gm
Soil/water distribution coef.	K_d	=	**6.26E-03**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.87E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **2.87E+00 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	8.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.12E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**7.60E-03**	**mg/m2-hour**

BOE-C6-0001628

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**6.23E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**6.23E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**3.25E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**9.76E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	9.76E-06	mg/kg-day
Reference dose	RfD	=	2.29E+00	mg/kg-day
Hazard Index	**HI**	**=**	**4.27E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	3.25E-06	mg/kg-day
Slope factor (potency)	SF	=	1.80E-03	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**5.85E-09**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1-octyl cyclohexane (surrogate=ethylbenzene)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.96E+05	mg/mole
Vapor pressure	VP	=	1.26E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	3.20E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	1.10E-02	mg/kg
Henry's Law Constant	H	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.00E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**2.09E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**8.59E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 8.59E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.83E+01	m
Calculated Flux	**F_x**	**=**	**1.78E-04**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.46E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.46E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**7.61E-08**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**2.28E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	2.28E-07	mg/kg-day
Reference dose	RfD	=	5.71E-01	mg/kg-day
Hazard Index	**HI**	=	**3.99E-07**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	7.61E-08	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001631

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: n-Propylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	1.32E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.79E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	5.40E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	3.30E-01	mg/kg
Henry's Law Constant	H	=	5.40E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.80E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**2.92E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**5.67E+01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 5.67E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.41E-01**	**mg/m2-hour**

BOE-C6-0001632

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.15E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.15E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**6.02E-05**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.81E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.81E-04	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**1.81E-02**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	6.02E-05	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001633

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Styrene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.00E+05	mg/mole
Vapor pressure	VP	=	8.05E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	6.40E-01	ug/l
Henry's Law Constant	H	=	1.10E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**7.04E-02**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	1.10E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	9.11E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**9.50E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **7.04E-02 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.10E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**9.96E-04**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**1.27E-06**	**mg/m2-hour**

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.04E-08**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.04E-08**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**5.45E-10**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.63E-09**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.63E-09	mg/kg-day
Reference dose	RfD	=	2.57E-01	mg/kg-day
Hazard Index	**HI**	=	**6.36E-09**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	5.45E-10	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001635

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,3,4-Tetrachlorobutane (surrogate=1,1,2,2-Tetrachloroethane)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.70E+05	mg/mole
Vapor pressure	VP	=	1.20E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	3.03E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	1.40E-02	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	5.60E-01	mg/kg
Henry's Law Constant	H	=	1.40E-02	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	7.90E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**8.24E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**3.13E+01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 3.13E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.10E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**9.96E-04**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**7.36E-02**	**mg/m2-hour**

BOE-C6-0001636

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**6.03E-04**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**6.03E-04**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**3.15E-05**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**9.44E-05**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	9.44E-05	mg/kg-day
Reference dose	RfD	=	6.00E-02	mg/kg-day
Hazard Index	**HI**	=	**1.57E-03**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	3.15E-05	mg/kg-day
Slope factor (potency)	SF	=	2.00E-01	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**6.29E-06**	

BOE-C6-0001637

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Tetrachloroethylene (PCE)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.70E+05	mg/mole
Vapor pressure	VP	=	2.43E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	7.50E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	7.50E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.70E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**2.81E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**2.50E+01**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.50E+01 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.20E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.01E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**2.98E-03**	**mg/m2-hour**

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**2.44E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**2.44E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.28E-06**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**3.83E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	3.83E-06	mg/kg-day
Reference dose	RfD	=	1.00E-02	mg/kg-day
Hazard Index	**HI**	=	**3.83E-04**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.28E-06	mg/kg-day
Slope factor (potency)	SF	=	2.10E-02	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**2.68E-08**	

BOE-C6-0001639

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Toluene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	9.20E+04	mg/mole
Vapor pressure	VP	=	3.74E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	2.70E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	2.70E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.40E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**1.46E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**7.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 7.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	8.70E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.22E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**1.01E-03**	**mg/m2-hour**

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**8.27E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**8.27E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**4.32E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.29E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.29E-06	mg/kg-day
Reference dose	RfD	=	8.57E-02	mg/kg-day
Hazard Index	**HI**	=	**1.51E-05**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	4.32E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,3-Trichlorobenzene (surrogate=1,2,4-Trichlorobenzene)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.80E+05	mg/mole
Vapor pressure	VP	=	2.76E-04	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	5.80E-02	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	3.90E-03	mg/kg
Henry's Law Constant	H	=	5.80E-02	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.70E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**1.77E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**1.16E-01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.16E-01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	3.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**4.21E-04**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.16E-04**	**mg/m2-hour**

BOE-C6-0001642

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**9.47E-07**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**9.47E-07**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**4.94E-08**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.48E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.48E-07	mg/kg-day
Reference dose	RfD	=	5.70E-02	mg/kg-day
Hazard Index	**HI**	=	**2.60E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	4.94E-08	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001643

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,4-Trichlorobenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.80E+05	mg/mole
Vapor pressure	VP	=	6.05E-04	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	5.80E-02	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	4.00E-03	mg/kg
Henry's Law Constant	H	=	5.80E-02	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.70E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**1.77E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**1.19E-01**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.19E-01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	3.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**4.21E-04**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**1.19E-04**	**mg/m2-hour**

BOE-C6-0001644

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**9.72E-07**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**9.72E-07**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**5.07E-08**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**1.52E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	1.52E-07	mg/kg-day
Reference dose	RfD	=	5.70E-02	mg/kg-day
Hazard Index	**HI**	=	**2.67E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	5.07E-08	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001645

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,1,1-Trichloroethane (1,1,1-TCA)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	1.63E-01	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	7.10E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	7.10E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.40E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**1.46E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**6.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 6.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.80E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.09E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**7.75E-04**	**mg/m2-hour**

BOE-C6-0001646

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**6.36E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**6.36E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**3.32E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**9.95E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	9.95E-07	mg/kg-day
Reference dose	RfD	=	2.86E-01	mg/kg-day
Hazard Index	**HI**	**=**	**3.48E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	3.32E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**No Slope Factor**	

BOE-C6-0001647

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Trichloroethlyene (TCE)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.30E+05	mg/mole
Vapor pressure	VP	=	7.61E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.93E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	4.20E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	4.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	9.40E+01	cm3/gm
Soil/water distribution coef.	K_d	=	**9.80E-02**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**2.75E+02**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.75E+02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.90E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.11E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**3.60E-02**	**mg/m2-hour**

BOE-C6-0001648

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**2.95E-04**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**2.95E-04**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**1.54E-05**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**4.62E-05**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	4.62E-05	mg/kg-day
Reference dose	RfD	=	1.71E-01	mg/kg-day
Hazard Index	**HI**	**=**	**2.69E-04**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.54E-05	mg/kg-day
Slope factor (potency)	SF	=	1.00E-02	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**1.54E-07**	

BOE-C6-0001649

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Trichlorofluoromethane (Freon 11)

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.40E+05	mg/mole
Vapor pressure	VP	=	1.05E+00	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	4.00E+00	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	4.00E+00	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	1.60E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**1.67E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**4.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 4.00E+00 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	8.70E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.22E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**5.77E-04**	**mg/m2-hour**

BOE-C6-0001650

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**4.73E-06**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**4.73E-06**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**2.47E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**7.40E-07**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	7.40E-07	mg/kg-day
Reference dose	RfD	=	2.00E-01	mg/kg-day
Hazard Index	**HI**	=	**3.70E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	2.47E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001651

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,4 - Trimethylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	2.76E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	2.30E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	1.90E+00	mg/kg
Henry's Law Constant	H	=	2.30E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	3.70E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**3.86E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**1.08E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 1.08E+02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**2.68E-01**	**mg/m2-hour**

BOE-C6-0001652

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**2.20E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**2.20E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**1.15E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**3.44E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	3.44E-04	mg/kg-day
Reference dose	RfD	=	1.70E-03	mg/kg-day
Hazard Index	**HI**	=	**2.02E-01**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	1.15E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001653

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,2,4 - Trimethylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	2.76E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	4.70E-01	ug/l
Henry's Law Constant	H	=	2.30E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**1.08E-01**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	2.30E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	3.70E+03	cm3/gm
Soil/water distribution coef.	K_d	=	**3.86E+00**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.08E-01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**2.07E-06**	**mg/m2-hour**

BOE-C6-0001654

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	C_i	=	**1.69E-08**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	C_o	=	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	C_t	=	**1.69E-08**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	IT_c	=	**8.84E-10**	**mg/kg-day**
Chemical Intake (non-carc. risk)	IT_{nc}	=	**2.65E-09**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	IT_{nc}	=	2.65E-09	mg/kg-day
Reference dose	RfD	=	1.70E-03	mg/kg-day
Hazard Index	**HI**	=	**1.56E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	8.84E-10	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	=	**No Slope Factor**	

BOE-C6-0001655

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,3,5 - Trimethylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	3.26E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	3.20E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=	6.80E-01	mg/kg
Henry's Law Constant	H	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	8.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**8.55E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**2.06E+02**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> 2.06E+02 mg/m3

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.52E-01	m
Calculated Flux	**F_x**	**=**	**5.12E-01**	**mg/m2-hour**

BOE-C6-0001656

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**4.20E-03**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**4.20E-03**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**2.19E-04**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**6.57E-04**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	6.57E-04	mg/kg-day
Reference dose	RfD	=	1.70E-03	mg/kg-day
Hazard Index	**HI**	**=**	**3.86E-01**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	2.19E-04	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**No Slope Factor**	

BOE-C6-0001657

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: 1,3,5 - Trimethylbenzene

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.20E+05	mg/mole
Vapor pressure	VP	=	3.26E-03	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=	3.40E-01	ug/l
Henry's Law Constant	H	=	3.20E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**1.09E-01**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	3.20E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	8.20E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**8.55E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**0.00E+00**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.09E-01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.50E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**1.05E-03**	**cm2/sec**
Depth of contamination or Csg	X	=	1.98E+01	m
Calculated Flux	**F_x**	**=**	**2.08E-06**	**mg/m2-hour**

BOE-C6-0001658

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**1.70E-08**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**1.70E-08**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**8.90E-10**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**2.67E-09**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	2.67E-09	mg/kg-day
Reference dose	RfD	=	1.70E-03	mg/kg-day
Hazard Index	**HI**	**=**	**1.57E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	8.90E-10	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**No Slope Factor**	

BOE-C6-0001659

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

Chemical: Xylenes

Variable Descriptions				Units
CALCULATION OF SOIL GAS CONCENTRATION				
A. SOURCE - Free Product/Soil>100mg/kg.				
Mole fraction	MF	=	0.00E+00	dimensionless
Molecular weight	MW	=	1.10E+05	mg/mole
Vapor pressure	VP	=	1.05E-02	atm
Universal gas constant	R	=	8.20E-05	atm-m3/mole-K
Temperature	T	=	2.98E+02	K
Calculated soil gas concentration	**C_{sg}(fp)**	**=**	**0.00E+00**	**mg/m3**
B. SOURCE - Groundwater				
Water contamination level	C_w	=		ug/l
Henry's Law Constant	H	=	3.00E-01	dimensionless
Calculated soil gas concentration	**C_{sg}(gw)**	**=**	**0.00E+00**	**mg/m3**
C. SOURCE - Soil < 100 mg/kg				
Soil contamination level	C_t	=		mg/kg
Henry's Law Constant	H	=	3.00E-01	dimensionless
Bulk density (dry)	ρ_b	=	1.54E+00	gm/cc
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Water-filled porosity	θ_w	=	2.57E-01	dimensionless
Weight fraction of organic carbon	f_{oc}	=	1.04E-03	dimensionless
Organic carbon partition coefficient	K_{oc}	=	2.00E+02	cm3/gm
Soil/water distribution coef.	K_d	=	**2.09E-01**	cm3/gm
Calculated soil gas concentration	**C_{sg}(s)**	**=**	**0.00E+00**	**mg/m3**
D. SOURCE - Measured Soil Gas				
Measured soil gas concentration	**C_{sg}(m)**	**=**	**1.30E+01**	**mg/m3 (ug/l)**

E. SOIL GAS CONCENTRATION USED IN RISK CALCULATIONS >>>> **1.30E+01 mg/m3**

DIFFUSIVE TRANSPORT UPWARD IN UNSATURATED ZONE				
Total porosity	θ	=	4.23E-01	dimensionless
Air-filled porosity	θ_a	=	1.66E-01	dimensionless
Diffusion coefficient in air	D_a	=	7.00E-02	cm2/sec
Effective diffusion coefficient	**D_e**	**=**	**9.82E-04**	**cm2/sec**
Depth of contamination or Csg	X	=	3.05E+00	m
Calculated Flux	**F_x**	**=**	**1.51E-03**	**mg/m2-hour**

BOE-C6-0001660

SITE ASSESSMENT & MITIGATION VAPOR RISK ASSESSMENT MODEL
Risk Calculations - Residential Scenario
Version: November 1999
Boeing Realty Corporation Former Boeing C-6 Facility, Los Angeles, California

CALCULATING VAPOR CONCENTRATION IN BUILDING

A. INDOOR AIR COMPONENT

Floor area of building	A	=	1.00E+00	m2
% of floor area that flux occurs			1.00E+00	dimensionless
Attenuation factor(Crack factor)	S_b	=	1.00E-02	dimensionless
Flux area within building	Af	=	**1.00E-02**	m2
Interior Height of building	R_h	=	2.44E+00	m
Volume of building	V	=	**2.44E+00**	m3
Exchange rate of air	E	=	5.00E-01	exchanges/hr
Ventilation rate	Q	=	**1.22E+00**	m3/hr
Indoor air component	**C_i**	**=**	**1.24E-05**	**mg/m3**

B. OUTDOOR AIR COMPONENT

Downwind contamination length	L	=	0.00E+00	m
Wind speed	u	=		m/hr
Height of building openings (or height of breathing zone)	h	=	2.00E+00	m
Outdoor air component	**C_o**	**=**	**0.00E+00**	**mg/m3**
C. TOTAL INDOOR AIR CONCENTRATION	**C_t**	**=**	**1.24E-05**	**mg/m3**

EXPOSURE SCENARIO

Body weight	BW	=	7.00E+01	kg
Inhalation rate	IR	=	2.00E+00	m3/hr
Inhalation rate	IR	=	**4.80E+01**	m3/day
Exposure duration	ED	=	2.50E+01	yrs
Hours per day	conversion		8.00E+00	hr/day
Exposure time	ET	=	**3.33E-01**	hr/24 hours
Days per week	conversion		5.00E+00	days/week
Weeks per year	conversion		5.00E+01	weeks/yr
Exposure frequency	EF	=	**2.50E+02**	days/yr
Averaging Time (carc. risk)	AT	=	2.74E+04	days
Averaging Time (non-carc. risk)	AT	=	**9.13E+03**	days
Chemical Intake (carc. risk)	**IT_c**	**=**	**6.45E-07**	**mg/kg-day**
Chemical Intake (non-carc. risk)	**IT_{nc}**	**=**	**1.93E-06**	**mg/kg-day**

NON-CARCINOGENIC RISK (Chronic Risk)

Chemical Intake (non-carc. risk)	**IT_{nc}**	=	1.93E-06	mg/kg-day
Reference dose	RfD	=	2.00E-01	mg/kg-day
Hazard Index	**HI**	**=**	**9.67E-06**	

CARCINOGENIC RISK

Chemical Intake (carc. risk)	IT_c	=	6.45E-07	mg/kg-day
Slope factor (potency)	SF	=	0.00E+00	1/(mg/kg-day)
Cancer Risk	**Risk**	**=**	**No Slope Factor**	

BOE-C6-0001661

GEOTECHNICAL PARAMETERS

Boeing Realty Corporation Former C-6 Facility, Los Angeles, California

Sample ID	Date Sampled	Depth (feet bgs)	Sieve Analysis (soil type)	Dry Bulk Density (g/cm3)	Moisture Content (percent by weight)	Total Porosity (fraction by volume)	Air-filled Porosity (fraction by volume)	Water-filled Porosity (fraction by volume)	TOC* (mg/kg)	f_{oc} (fraction by weight)
I-34-4.5	1/22/2001	4.5	Silt	1.87	18.9	0.31	0.05	0.26	610	0.00061
EIA290176-001 (I-34-5)	1/29/2001	5	Silt	1.51	15.9	0.43	0.19	0.24	520	0.00052
EIA290176-010 (D-29-5)	1/29/2001	5	Silt	1.44	20.3	0.46	0.16	0.29	2350	0.0024
EIA29176-018 (I-25-5)	1/29/2001	5	Silt	1.34	17.8	0.49	0.26	0.24	690	0.00069
Average				**1.54**		**0.42**	**0.17**	**0.26**	**1043**	**0.0010**

Notes:

The air-filled porosity values were calculated from gravimetric data, not volumetric data.

* foc = the weight fraction of organic carbon in soil = TOC/1,000,000

CHEMICAL PARAMETERS
VAPOR PHASE MIGRATION MODELING
Boeing Realty Corporation Former C-6 Facility, Los Angeles, California

CAS No.		MW (mg/mole)	Ref.	H' (dimension-less)	Ref.	Da (cm^2/sec)	Ref.	VP (atm)	Temp. (°C)	Temp. (°K)	Ref.	K_{oc} (cm^3/g)	Ref.	Water Solubility (mg/L-water)	Ref.	CA SFi (inh) $(mg/kg\text{-}day)^{-1}$	CA Chronic RfDi (inh) (mg/kg-day)
Volatile Organic Compounds																	
67-64-1	Acetone	5.8E+04	a	1.6E-03	a	1.2E-01	a	3.0E-01	25	298.15	b	5.8E-01	a	1.0E+06	a	0.00E+00	1.00E-01
71-43-2	Benzene	7.8E+04	a	2.3E-01	a	8.8E-02	a	1.2E-01	25	298.15	b	6.2E+01	a	1.8E+03	a	1.00E-01	1.71E-02
104-51-8	n-Butylbenzene	1.3E+05	a	5.4E-01	a	7.5E-02	a	1.3E-03	23	296.15	d	2.8E+03	a	1.4E+01	a	0.00E+00	1.00E-02
135-98-8	sec-Butylbenzene	1.3E+05	a	7.7E-01	a	7.5E-02	a	1.4E-03	20	293.15	d	2.2E+03	a	1.7E+01	a	0.00E+00	1.00E-02
98-06-6	tert-Butylbenzene	1.3E+05	a	5.2E-01	a	7.5E-02	a	2.9E-03	25	298.15	b	2.2E+03	a	3.0E+01	a	0.00E+00	1.00E-02
75-15-0	Carbon disulfide	7.6E+04	a	1.2E+00	a	1.0E-01	a	4.7E-01	25	298.15	b	4.6E+01	a	1.2E+03	a	0.00E+00	2.00E-01
56-23-5	Carbon tetrachloride	1.5E+05	a	1.2E+00	a	7.8E-02	a	1.5E-01	25	298.15	b	1.5E+02	a	7.9E+02	a	1.50E-01	1.14E-02
67-66-3	Chloroform	1.2E+05	a	1.5E-01	a	1.0E-01	a	2.6E-01	25	298.15	b	5.3E+01	a	7.9E+03	a	1.90E-02	8.57E-02
75-71-8	Dichlorodifluoromethane	1.2E+05	a	4.1E+00	a	8.0E-02	a	5.8E+00	21	294.15	b	5.8E+01	a	2.8E+02	a	0.00E+00	5.70E-02
75-34-3	1,1 - Dichloroethane (1,1-DCA)	9.9E+04	a	2.3E-01	a	7.4E-02	a	3.1E-01	25	298.15	b	5.3E+01	a	5.1E+03	a	5.70E-03	1.40E-01
107-06-2	1,2-Dichloroethane (EDC)	9.9E+04	a	4.0E-02	a	1.0E-01	a	1.1E-01	25	298.15	b	3.8E+01	a	8.5E+03	a	7.00E-02	1.14E-01
75-35-4	1,1-Dichloroethylene (1,1-DCE)	9.7E+04	a	1.1E+00	a	9.0E-02	a	7.8E-01	25	298.15	b	6.5E+01	a	2.3E+03	a	1.75E-01	2.00E-02
156-59-2	cis-1,2-Dichloroethylene (cis 1,2-DCE)	9.7E+04	a	1.7E-01	a	7.4E-02	a	2.4E-04	20	293.15	b	3.6E+01	a	3.5E+03	a	0.00E+00	1.00E-02
156-60-5	trans-1,2-Dichloroethylene (trans-1,2-DCE)	9.7E+04	a	3.8E-01	a	7.1E-02	a	5.2E-01	30	303.15	b	3.8E+01	a	6.3E+03	a	0.00E+00	2.00E-02
100-41-4	Ethylbenzene	1.1E+05	a	3.2E-01	a	7.5E-02	a	1.3E-02	25	298.15	b	2.0E+02	a	1.7E+02	a	0.00E+00	5.71E-01
104-76-7	2-Ethyl-1-hexanol (surrogate=butanol)	1.3E+05	b	3.6E-04	b	8.0E-02	b	1.8E-04	25	298.15	b	6.9E+00	b	7.4E+04	b	0.00E+00	1.00E-01
98-82-8	Isopropyl-benzene (cumene, 1-methyethyl benzene)	1.2E+05	a	4.9E+01	a	7.5E-02	a	5.9E-03	25	298.15	b	2.2E+02	a	6.1E+01	a	0.00E+00	1.10E-01
591-78-6	2-Hexanone (surrogate=MIBK)	1.0E+05		2.4E-02	a	8.0E-02	a	3.3E-01	25	298.15	b	6.0E+00	a	1.5E+05	a	1.80E-03	2.29E+00
99-87-6	4-Isopropyltoluene (p-isopropyltoluene, p-cymene) - (as isopropyl-benzene)	1.3E+05	b	4.9E+01	a	7.5E-02	a	2.0E-03	25	298.15	b	2.2E+02	a	6.1E+01	a	0.00E+00	1.10E-01
75-09-2	Methylene Chloride	8.5E+04	a	9.0E-02	a	1.0E-01	a	5.7E-01	25	298.15	b	1.0E+01	a	1.3E+04	a	3.50E-03	1.14E-01
78-93-3	Methyl Ethyl Ketone	7.2E+04	a	1.1E-03	a	9.0E-02	a	1.2E-01	25	298.15	b	4.5E+00	a	2.7E+05	a	0.00E+00	1.43E-01
108-10-1	4-Methyl-2-pentanone (MIBK)	1.0E+05	a	5.7E-03	a	7.5E-02	a	2.6E-02	25	298.15	b	1.3E+02	a	1.9E+04	a	0.00E+00	2.29E-02
1634-04-4	MTBE	8.5E+04	a	2.4E-02	a	8.0E-02	a	3.3E-01	25	298.15	b	6.0E+00	a	1.5E+05	a	1.80E-03	2.29E+00
1795-15-9	1-octyl cyclohexane (surrogate=ethylbenzene)	2.0E+05	a	3.2E-01	a	7.5E-02	a	1.3E-02	25	298.15	b	2.0E+02	a	1.7E+02	a	0.00E+00	5.71E-01
103-65-1	n-Propylbenzene	1.2E+05	b	5.4E-01	a	7.5E-02	a	1.3E-03	6.3	279.45	b	2.8E+03	a	1.4E+01	a	0.00E+00	1.00E-02
100-42-5	Styrene	1.0E+05	a	1.1E-01	a	7.1E-02	a	8.1E-03	25	298.15	b	9.1E+02	a	3.1E+02	a	0.00E+00	2.57E-01
3405-32-1	1,2,3,4-Tetrachlorobutane (surrogate=1,1,2,2-Tetrachloroethane)	1.7E+05	a	1.4E-02	a	7.1E-02	a	1.2E-02	30	303.15	b	7.9E+01	a	3.0E-03	a	2.00E-01	6.00E-02
79-34-5	1,1,2,2-Tetrachloroethane	1.7E+05	a	1.4E-02	a	7.1E-02	a	1.2E-02	30	303.15	b	7.9E+01	a	3.0E-03	a	2.00E-01	6.00E-02
127-18-4	Tetrachloroethylene (PCE)	1.7E+05	a	7.5E-01	a	7.2E-02	a	2.4E-02	25	298.15	b	2.7E+02	a	2.0E+02	a	2.10E-02	1.00E-02
108-88-3	Toluene	9.2E+04	a	2.7E-01	a	8.7E-02	a	3.7E-02	25	298.15	b	1.4E+02	a	5.3E+02	a	0.00E+00	8.57E-02
87-61-6	1,2,3-Trichlorobenzene (surrogate=1,2,4-Trichlorobenzene)	1.8E+05	a	5.8E-02	a	3.0E-02	a	2.8E-04	25	298.15	b	1.7E+03	a	1.8E+01	b	0.00E+00	5.70E-02
120-82-1	1,2,4-Trichlorobenzene	1.8E+05	a	5.8E-02	a	3.0E-02	a	6.1E-04	25	298.15	b	1.7E+03	a	3.0E+02	a	0.00E+00	5.70E-02
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	1.3E+05	a	7.1E-01	a	7.8E-02	a	1.6E-01	25	298.15	b	1.4E+02	a	1.3E+03	a	0.00E+00	2.86E-01
79-00-5	1,1,2 - TCA	1.3E+05	a	3.7E-02	a	7.8E-02	a	3.1E-02	25	298.15	b	7.5E+01	a	4.4E+03	a	5.70E-02	4.00E-03
79-01-6	Trichloroethlyene (TCE)	1.3E+05	a	4.2E-01	a	7.9E-02	a	7.6E-02	20	293.15	b	9.4E+01	a	1.1E+03	a	1.00E-02	1.71E-01
75-69-4	Trichlorofluoromethane (Freon 11)	1.4E+05	a	4.0E+00	a	8.7E-02	a	1.0E+00	25	298.15	b	1.6E+02	a	1.1E+03	a	0.00E+00	2.00E-01
96-18-4	1,2,3 - Trichloropropane	1.5E+05	a	1.1E+00	a	7.1E-02	a	4.9E-03	25	298.15	b	5.1E+01	a	2.7E+03	a	7.00E+00	5.00E-03
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	1.9E+05	b	2.1E+01	a	2.9E-02	a	3.7E-01	20	293.15	b	1.6E+02	a	1.1E+03	a	0.00E+00	2.00E-01
95-63-6	1,2,4 - Trimethylbenzene	1.2E+05	a	2.3E-01	a	7.5E-02	a	2.8E-03	25	298.15	b	3.7E+03	a	2.6E-01	a	0.00E+00	1.70E-03
108-67-8	1,3,5 - Trimethylbenzene	1.2E+05	a	3.2E-01	a	7.5E-02	a	3.3E-03	25	298.15	b	8.2E+02	a	5.0E+01	a	0.00E+00	1.70E-03
108-05-4	Vinyl acetate	8.6E+04	a	2.1E-02	a	8.5E-02	a	1.2E-01	20	293.15	b	5.3E+00	a	2.0E+04	a	0.00E+00	5.71E-02
75-01-4	Vinyl chloride	6.3E+04	a	1.1E+00	a	1.1E-01	a	3.5E+00	25	298.15	b	1.9E+01	a	2.8E+03	a	2.70E-01	7.43E-03
1330-20-7	Xylenes	1.1E+05	a	3.0E-01	a	7.0E-02	a	1.1E-02	25	298.15	b	2.0E+02	a	1.6E+02	a	0.00E+00	2.00E-01

References:

a USEPA Region 9, Preliminary Remediation Goals (PRGs), 2000.
b U.S. National Library of Medicine Hazardous Substance Data Bank (HSDB), http://www.nlm.nih.gov/pubs/factsheets/hsdbfs.html
c Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_select?select=csf
d Vershueren, K., Handbook of Environmental Data on Organic Chemicals. Van Nostrand Reinhold Company, Inc. 1983.
e Cornell University Material Safety Data Sheet (MSDS) Search Site, http://www.msds.pdc.cornell.edu/

Italics = Either toxity values or physical parameter information is not readily available, or IARC cancer group is 3 and/or USEPA cancer group is C or D (i.e., insufficient toxicological data for assessment of cancer in humans).

LEADSPREAD Model Results

LEAD RISK ASSESSMENT SPREADSHEET
CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.028
(ug/g)	**9.8**
Lead in Water (ug/l)	15
% Home-grown Produ	7%
(ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.1	2.1	2.5	3.0	3.4	676	1063
BLOOD Pb, CHILD	1.6	3.0	3.5	4.3	4.9	146	247
BLOOD Pb, PICA CHILD	1.7	3.1	3.7	4.4	5.1	94	159
BLOOD Pb, OCCUPATIC	1.1	2.0	2.4	2.9	3.3	3475	5464

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug		10	
Skin area, residential	cm^2	####	####
Skin area occupationa	cm^2	####	
Soil adherence	ug/cm^2	70	200
Dermal uptake consta	(ug/dl)/(ug/	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/	0	0.2
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/	0.1	0.2
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	4.4	

Click here for REFERENCES

PATHWAYS

ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.00	0%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.01	1%	6.3E-4	0.01	1%
Inhalation, bkgrnd		0.05	4%		0.03	3%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.84	74%		0.84	76%
Food Ingestion, bkgrnd		0.22	19%		0.23	21%
Food Ingestion	2.4E-3	0.02	2%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.00	0%		0.00	0%
Soil Ingestion	7.0E-3	0.07	4%	1.4E-2	0.14	8%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.04	2%		0.04	2%
Water Ingestion		0.96	59%		0.96	57%
Food Ingestion, bkgrnd		0.50	31%		0.50	30%
Food Ingestion	5.5E-3	0.05	3%		0.05	3%

APPENDIX C

Groundwater Protection Assessment

C.1 INTRODUCTION

The objective of the groundwater protection assessment was to evaluate whether existing chemical concentrations in on-site shallow soils (within the upper 12 feet of soil) have the potential to degrade underlying groundwater quality. Even though shallow groundwater beneath and in proximity to the subject parcel is not used as a domestic water supply, the LARWQCB requested, as a conservative measure, that an evaluation be conducted of potential downward chemical migration from soil resulting in possible degradation of the Bellflower aquitard. The Bellflower aquitard is the most shallow water-bearing zone beneath the subject parcel. This evaluation conservatively (and unrealistically) assumes that the Bellflower aquitard is a part of the underlying aquifers providing domestic water supply. As described below, the assessment was conducted by further assuming a conservative scenario regarding chemical migration and mixing in groundwater following approved USEPA and LARWQCB methodology and assumptions.

The maximum and mean concentrations of each chemical detected in soil that has a California drinking water standard were compared to site-specific SSLs derived from California drinking water standards, specifically primary or secondary MCLs. Estimates of mean concentrations were derived from available sample data and are defined as the 95% UCL of the arithmetic mean. Initial site-specific SSLs were derived using the following formula presented in Section 2.5 of the USEPA document entitled *Soil Screening Guidance: Technical Background Document (TBD),* dated July 1996:

$$\text{Initial SSL} = \text{MCL}\ [(K_{oc} * f_{oc}) + ((O_w + O_a * H')/P_b)] \qquad \text{(Equation 1)}$$

Where:

Initial SSL = soil screening level, mg/kg;
MCL = maximum contaminant level, mg/L;
K_{oc} = soil organic carbon-water partition coefficient, L/kg;
f_{oc} = organic carbon content of soil, kg/kg;
O_w = water-filled soil porosity, L_{water}/L_{soil};
O_a = air-filled soil porosity, L_{air}/L_{soil};
H' = Henry's law constant, dimensionless; and
P_b = dry soil bulk density, kg/L.

Site-specific geotechnical parameters are presented in Table 15 of the soil investigation report. The above equation is a partitioning formula, which does not account for chemical attenuation during migration in soil or mixing with groundwater. To better represent contaminant migration in the soil column, an attenuation factor of 13 was applied to the initial SSLs for VOCs. For non-VOCs, attenuation factors were derived using the formulas presented in Appendix A of LARWQCB's May 1996 *Interim Site Assessment & Cleanup Guidebook* (Table C-1). Both attenuation factors were derived assuming site-specific average soil particle size distributions of 30 percent sand, 57 percent silt, and 13 percent clay, and a distance of 53 feet from soil impacts

to the groundwater table. This distance is considered to be appropriate because the depth to groundwater at the site is approximately 65 feet bgs, and the maximum COPC depth addressed in this analysis is 12 feet bgs.

A USEPA default dilution attenuation factor (DAF) of 20 was applied to the initial SSL to account for limited groundwater mixing. This default value is presented in the above-referenced July 1996 USEPA document, and was used by USEPA to develop generic SSLs. The resulting site-specific SSL is equal to the initial SSL (assuming no soil attenuation or groundwater mixing) multiplied by the product of a soil attenuation factor (e.g. 13 for VOCs) and a groundwater mixing factor of 20 (Table C-1).

The maximum detected concentrations in shallow soil at Parcel C are below the respective SSLs in all but one chemical (selenium). For selenium, the SSL is 8.6 mg/kg and the maximum detected concentration is shallow soil was 14.0 mg/kg. When SSLs are compared against mean concentrations (estimated using the 95%UCL) all of the COPCs (including selenium) fall below their respective site-specific SSLs. Assuming that the mean concentration of a chemical in shallow soil provides a reasonable estimate of vadose zone conditions, then this analysis shows that the residual concentrations of chemicals remaining in the upper 12 feet of soil at Parcel C do not pose a threat to groundwater quality at levels greater than MCLs.

TABLE C-1
COMPARISON OF SOIL SCREENING LEVELS TO MAXIMUM SOIL CONCENTRATIONS AND 95% UCL
Boeing Realty Corporation Former C-6 Facility
Parcel C
Los Angeles, California

Analyte	SSL	Max Concentration in Soil (0-12 feet bgs)	Mean Concentration in Soil (95% UCL)
	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1248	8.29E+01	1.10E-01	1.88E-02
Aroclor 1254	8.29E+01	2.30E-01	2.12E-02
Aroclor 1260	8.29E+01	9.30E-01	6.02E-02
Arsenic	2.74E+02	2.35E+01	3.33E+00
Benzo(a)pyrene	3.59E+03	6.10E+00	2.65E-01
Beryllium	1.61E+04	1.80E+00	5.40E-01
Cadmium	1.82E+02	5.29E+01	3.40E-01
Carbon tetrachloride	7.01E-02	1.80E-03	3.57E-03
Copper	1.18E+06	1.10E+03	2.40E+01
1,1 - Dichloroethane (1,1-DCA)	3.89E-01	2.40E-02	3.60E-03
1,2-Dichloroethane	3.31E-02	4.60E-03	3.55E-03
1,1-Dichloroethene	7.26E-01	2.20E-01	4.69E-03
cis-1,2-Dichloroethylene (cis 1,2-DCE)	4.32E-01	1.40E-01	3.79E-03
Ethylbenzene	7.50E+01	1.10E+01	2.93E-02
Hexachlorobenzene	5.31E+00	1.20E-01	1.37E-01
Lead	1.04E+04	1.02E+03	9.89E+00
Mercury	3.51E+01	6.00E-01	5.00E-02
Methyl tert-butyl ether	7.80E-01	2.10E-02	3.94E-03
Selenium	8.63E+00	1.40E+01	6.50E-01
Silver	4.63E+01	4.20E+00	4.70E-01
Tetrachloroethene	6.98E-01	1.60E-01	4.01E-03
Thallium	6.53E+01	3.00E+00	1.52E+00
Toluene	1.42E+01	1.20E+00	5.98E-03
1,2,4-Trichlorobenzene	2.46E+01	4.00E-03	1.23E-02
1,1,1-Trichloroethane (1,1,1-TCA)	2.31E+01	9.30E-01	6.70E-03
1,1,2 - TCA	3.62E-01	6.40E-03	3.56E-03
Trichloroethylene	4.69E-01	3.40E-01	9.87E-03
Xylene (total)	1.86E+02	1.19E+02	2.65E-01

Notes:
UCL = Upper confidence level
SSL = Site-specific soil screening level
mg/kg = milligrams per kilogram

APPENDIX D

UST Location Map

APPENDIX E

Database Transmittal Letter

ENGLAND
GEOSYSTEM
ENVIRONMENTAL ENGINEERING

March 12, 2002 Project No. 887.001/500

Mr. Scott P. Zachary
HALEY & ALDRICH, INC.
9040 Friars Road, Suite 202
San Diego, California 92108

Data Management
Boeing Realty Corporation
Former C-6 Facility
Los Angeles, California

Dear Mr. Zachary:

England Geosystem, Inc. has performed data management services for the former Boeing C-6 facility (Site) since April 2001. The general framework for the project was established in a proposal submitted to Boeing Realty Corporation by Haley & Aldrich on February 26, 2001. This letter presents:

- Procedures, principal tasks, and assumptions associated with the data management effort.
- Evaluation of the quality of the dataset.

DATA TYPE AND TEMPORAL COVERAGE

The data management scope of services included organization and maintenance of environmental data consisting primarily of chemical analyses of soil samples, water samples, sediment samples, and soil vapor samples collected at various locations and at various depths on and near the Site. Secondary information in the dataset associated with site characterization activities includes groundwater elevations and selected field analytical parameters. The initial scope of services was limited to maintaining environmental information for only a specific portion of the Site: the parcel C area. During the course of the project, additional data that were relevant to Parcel C, but were not all-inclusive of the Site, were included to facilitate various analyses.

Characterization activities have been conducted at this Site by numerous investigators over a significant time period dating back to the early 1980s. However, this dataset includes information collected from March 1987 until the present. For the sake of terminology, data collected and included in the dataset prior to October 2000 are referred to as *legacy* or *historical* data, and post-October 2000 data are referred to as *current* data.

15375 Barranca Parkway• Suite F-106• Irvine, California 92618-2207
www.englandgeosystem.com• info@englandgeosystem.com
(949) 453-8085• FAX (949) 453-0733

DATA ORGANIZATION

The data currently reside in a Microsoft Access 2000™ format database. To the extent possible, the table naming and field definitions have been established to match the format of the Boeing C-1 facility database. These criteria were obtained from the *Data Management Plan Rev. 2: The Boeing Company C-1 Facility Redevelopment Project, Long Beach, California August 2000 (CH_2Mhill).*

DATA SOURCES

Data from numerous sources were obtained and combined to create the electronic environmental database. The following list describes the primary sources (the designation included in parentheses is reference to the individual datasets obtained and combined):

- Integrated Environmental Services, Inc. provided an electronic version of historical data (IES-1).
- Orange Coast Analytical was authorized by Kennedy-Jenks Inc. to provide (and they did) electronic versions of historical data (OCA-1).
- STL laboratories provided electronic data in the form of chains-of-custody, PDF formatted reports, and electronic data deliverable (EDD) files (STL-1).
- STL laboratories provided electronic versions of data provided to them by Del Mar laboratories as a laboratory subcontractor (STL-2).
- Haley & Aldrich provided an electronic version of vapor analyses (HA-1).
- Haley & Aldrich provided paper copies of data for various locations on the Site from file versions of historical reports. Data was then hand entered (HA-2).
- Haley & Aldrich provided survey coordinates and site object naming information as paper and electronic documents (HA-3).
- Haley & Aldrich provided information regarding locations of site objects (borings) removed by remedial excavation (HA-4).
- TRC Consultants Inc. provided paper copies of soil and chemical analysis for certain site investigation activities related to the ILM facility (ILM-1).
- Tait Environmental Services provided paper copies of groundwater sampling information, including field data sheets and field chains-of-custody (TES-1).

Location information for each site object (sampling location at the ground surface) has been provided and verified by Haley & Alrich.

DATA VERIFICATION

Data verification consisted of comparing the electronic information included in the dataset with an original data source. The original data sources consisted of a combination of previous reports prepared by others and chemical laboratory data reports. The purpose of the data verification was to provide a measure of the agreement between the electronic version of the data and the original data sources. The data verification task was not designed to ascertain if all the available or previously collected data were included in the database. It was designed to evaluate the degree of agreement between data included in the database and the original source information.

Five percent of the individual legacy records were randomly selected, using a quasi-random number generator. For the purpose of this project, each individual record is defined as a single analytical result (i.e., one chemical analyte at one sampling location and the associated data included with it). The random numbers generated corresponded to individual record numbers. Using a standard selection query, the records corresponding to the generated numbers were selected and then transferred to a database validation system.

The database validation system is a computer application that assisted the database technicians in the verification task. Each record was subjected to field by field verification (with paper copies of the dataset) by database technicians. The scope of services stipulated that an additional five percent of the remaining records would be selected for verification when data inconsistencies were encountered. Because of a significant number of non-substantive discrepancies found in sample dates and times of the legacy data, the verification process was modified under the agreement between England Geosystem and Haley & Aldrich early in the program so that only a subset of fields (sample name, the analytical results, analyte units, analyte name, detection limits, and detection limit units) in each record was verified. These fields were considered the most important and substantive fields to verify for use of and reliance upon the data.

The original scope of services required verification of only the legacy data. However, as current data were examined, it was discovered that there were differences between the original data source and the current data. In addition, differences were discovered between electronic versions of the current data and the corresponding paper copies of information. Only an insignificant number (<0.01%) of the inconsistencies were related to actual laboratory results. The primary inconsistencies involved differences in sample naming between field data records and the laboratory, and incomplete or incorrect coordinates of the object locations. The inconsistencies, while not widespread, impaired the validity and utility of the dataset to the point that it could not be used to provide reliable information and statistical evaluations. Haley & Aldrich and England Geosystem began a wide-ranging program to correct the sample naming inconsistencies

and to verify and include correct coordinates for objects and samples. In addition, the current data, including the hand-entered data, were subjected to the data verification process as described above.

During the course of this project, two sets of legacy data verification were performed which amounted to approximately 10% of the legacy data. Approximately 10% of the current electronic data and 5% of the hand-entered data were verified. Only the substantive subset of fields, as described above, was verified for the current data and hand-entered data. All of the sample names and locations for the current data, as well as the hand-entered data, were verified. When a discrepancy was noted, individuals performing the verification corrected the data based on the paper copies of the information.

In dealing with large volumes of data from numerous sources over a long period of time, it is generally not cost effective to create a totally error free dataset. Instead, data verification is used to quantify the degree of confidence that the dataset possesses.

The following percentages are based on an extrapolation of the observed discrepancies prior to any corrections. Based on data verification, approximately 92% of the legacy data is error-free; 99.8% of the current data is error-free; and 99.99% of the hand-entered data is error-free. When non-substantive inconsistencies such as inaccurate dates and detection limit errors are removed, verification indicates that the legacy data are 97.8% accurate.

CONCLUSION

Review of the dataset by England Geosystem indicates that the data contained within the database have been verified according to and beyond the requirements of the agreed scope of services. In our opinion, the dataset contains sufficient quality data, distribution, and number of data locations to allow qualified individuals to conduct environmental characterization assessments and prepare risk assessments for the upper portions of the subsurface zones beneath Parcel C of the Site.

Sincerely,

ENGLAND GEOSYSTEM, INC.

Frank J. Hagan
Project Manager

FJH:sp

n:\sharron\archived projects\0800 projects\887\887-001-500-L-Zachary-DataMgmt

ENGLAND GEOSYSTEM
ENVIRONMENTAL ENGINEERING

APPENDIX F

Data Validation Reports

Appendix F
Data Validation Reports

Data validation was performed as part of the project data quality program. A third-party data validation company, Laboratory Data Consultants (LDC), was used for this purpose. Soil samples collected prior to the involvement of Haley & Aldrich in 2000 were classified as "historic" while the samples collected during and after 2000 were considered "recent." Haley & Aldrich maintained a running total of recent soil samples analyzed by Severn Trent Laboratory and grouped each sample by analysis method.

For data validation, LDC validated approximately 11% of STL's soil analyses. Specifically, a three-tiered validation program was implemented. Approximately 8.6 percent of the STL soil sample analyses conducted were subjected to Tier 1 validation, approximately 2.1 percent were subjected to Tier 2 validation, and approximately 0.5 percent were subjected to Tier 3 validation. Tier 1 validation involves checking for completeness, sample holding time violations, and the laboratory's QA/QC procedures, including method blank, matrix spike, and matrix spike duplicate analyses. Tier 2 validation includes the Tier 1 elements plus checks for transcription errors and a review of instrument calibration data. Tier 3 validation includes the Tier1 and 2 elements plus qualitative and quantitative checks on the reported results using the raw data provided by the analytical laboratory. A summary of the data validation performed is included in the table below.

RECENT SOIL SAMPLES VALIDATED												
ALL SAMPLES	1,515	134	817	173	14	1,108	30	99	31	4	98	4,023
TIER 1	135	7	34	13	3	94	9	4	10	3	34	346
TIER 2	28	5	5	12	0	18	2	5	4	0	5	84
TIER 3	9	0	2	0	0	6	1	0	2	0	2	22

Based on the results of the data validation performed, STL generally provided laboratory analysis in compliance with project data quality objectives, USEPA laboratory protocols and was considered validated for the purposes of site investigation and screening-level risk assessment calculations. Few sample delivery groups required qualification. However, one common qualification reported by LDC was the use of "J" and "UJ" flags for compounds detected below the method detection limit. These flags were regularly omitted from the volatile compounds Acrolein and Chloroethane, the metal Antimony, and TPH. Target compounds occasionally required qualifier flags as noted in the attached LDC reports. Acetone was encountered as a lab contaminant in two blanks. The complete data validation summary reports from LDC are contained in the following pages.

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Ogden Environmental
5510 Morehouse Drive, Suite 300
San Diego, CA 92121
ATTN: Mr. Rolf Schottle

December 19, 2000

SUBJECT: Boeing Redevelopment Corporation, C-6 Facility, Data Validation

Dear Mr. Schottle,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 29, 2000. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 5673:

SDG #	Fraction
E0J130321, E0J130324, E0J200130	Volatiles, Polychlorinated Biphenyls, Metals, TPH as Gasoline, TPH as Extractables, Hexavalent Chromium, pH

The data validation was performed under Ogden Level 1, Level 2, & Level 3 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996

Please feel free to contact us if you have any questions.

Sincerely,

Richard M. Amano
President/Principal Chemist

5673COV.OGD

Attachment 1

LDC #5673 (Ogden / Boeing Redevelopment Corporation, C-6 Facility)

LDC	SDG#	DATE REC'D	DATE DUE	VOA (8260B)		PCB (8082)		Metals (SW846)		TVPH (8015)		TEPH (8015)		CRVI (7196A)		pH (9045)																					
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	E0J130321	11-29-00	12-28-00	0	20	-	-	0	12	0	9	0	9	-	-	0	6	Level 1																			
A	E0J130321	11-29-00	12-28-00	0	9	-	-	0	6	0	4	0	4	-	-	0	3	Level 2																			
A	E0J130321	11-29-00	12-28-00	0	3	-	-	0	2	0	2	0	2	-	-	0	1	Level 3																			
B	E0J120324	11-29-00	12-28-00	0	16	-	-	0	14	0	12	0	12	0	5	0	1	Level 1																			
B	E0J120324	11-29-00	12-28-00	0	7	-	-	0	6	0	5	0	5	0	2	0	1	Level 2																			
B	E0J120324	11-29-00	12-28-00	0	3	-	-	0	2	0	2	0	2	0	1	0	1	Level 3																			
C	E0J200130	12-7-00	12-28-00	0	16	0	12	0	11	0	7	0	7	-	-	-	-	Level 1																			
C	E0J200130	12-7-00	12-28-00	0	7	0	5	0	5	0	4	0	4	-	-	-	-	Level 2																			
C	E0J200130	12-7-00	12-28-00	0	3	0	2	0	2	0	2	0	2	-	-	-	-	Level 3																			
Total				0	84	0	19	0	60	0	47	0	47	0	8	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Shaded cells indicate Ogden Level 3 validation (all other cells are Level 1 or 2 validation)

58738

BOE-C6-0001679

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Volatiles
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J130321

Sample Identification

C-2-150-5**	C-2-162-1
C-2-150-10**	C-2-162-5
C-2-150-15	C-2-162-10
C-2-151-1**	C-2-163-1
C-2-151-5*	C-2-163-5
C-2-152-5*	C-2-163-10
C-2-152-10*	C-2-164-5
C-2-152-15*	C-2-164-10
C-2-153-5*	C-2-150-5MS
C-2-155-5*	C-2-150-5MSD
C-2-155-10*	C-2-157-10MS
C-2-156-1*	C-2-157-10MSD
C-2-156-5*	
C-2-156-10	
C-2-157-1	
C-2-157-5	
C-2-157-10	
C-2-159-1	
C-2-159-5	
C-2-159-10	

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

BOE-C6-0001681

Introduction

This data review covers 32 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
10/25/00	Chloroethane Trichlorofluoromethane 2-Chloroethylvinyl ether Hexachlorobutadiene	40.308 35.879 33.282 37.824	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5* 0302149BLK	J (all detects) UJ (all non-detects)	A

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/25/00	Acrolein	0.03491 (≥0.05)	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5* 0302149BLK	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/26/00	Dichlorodifluoromethane Hexachlorobutadiene	42.1 55.7	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5* 0302149BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/26/00	Acrolein	0.03582 (≥0.05)	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5* 0302149BLK	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples

reviewed by Level 2 criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIV. System Performance

The system performance was within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Data Qualification Summary - SDG E0J130321

SDG	Sample	Compound	Flag	A or P	Reason
E0J130321	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5*	Chloroethane Trichlorofluoromethane 2-Chloroethylvinyl ether Hexachlorobutadiene	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
E0J130321	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5*	Acrolein	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
E0J130321	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5*	Dichlorodifluoromethane Hexachlorobutadiene	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E0J130321	C-2-150-5** C-2-150-10** C-2-151-1** C-2-151-5* C-2-152-5* C-2-152-10* C-2-152-15* C-2-153-5* C-2-155-5* C-2-155-10* C-2-156-1* C-2-156-5*	Acrolein	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Laboratory Blank Data Qualification Summary - SDG E0J130321

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 12, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Volatiles
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J120324

Sample Identification

C-2-139-2**	2-149-5
C-2-139-5**	2-149-10
C-2-139-10**	C-2-139-2MS
C-2-140-1*	C-2-139-2MSD
C-2-140-5*	C-2-146-10MS
C-2-141-5*	C-2-146-10MSD
C-2-141-10*	
C-2-142-1*	
C-2-142-5*	
C-2-143-5*	
C-2-143-10	
C-2-145-6	
C-2-146-1	
C-2-146-5	
C-2-146-10	
C-2-147-5	
C-2-147-10	
C-2-147-15	
C-2-148-5	
C-2-148-10	

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

BOE-C6-0001689

Introduction

This data review covers 26 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
10/24/00	Chloroethane	32.668	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5* 0301396BLK	J (all detects) UJ (all non-detects)	A

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/24/00	Acrolein tert-Butanol	0.01768 (≥0.05) 0.00651 (≥0.05)	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5* 0301396BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/25/00	Chloroethane Hexachlorobutadiene	26.3 39.4	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5* 0301396BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/25/00	Acrolein tert-Butanol	0.02103 (≥0.05) 0.00733 (≥0.05)	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5* 0301396BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
0301396BLK	10/25/00	Unknown (24.049)	8.0 ug/Kg	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5* C-2-143-10 C-2-145-6 C-2-146-1 C-2-146-5

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIV. System Performance

The system performance was within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Data Qualification Summary - SDG E0J120324

SDG	Sample	Compound	Flag	A or P	Reason
E0J120324	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5*	Chloroethane	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
E0J120324	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5*	Acrolein tert-Butanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
E0J120324	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5*	Chloroethane Hexachlorobutadiene	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E0J120324	C-2-139-2** C-2-139-5** C-2-139-10** C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5*	Acrolein tert-Butanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Laboratory Blank Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Facility

Collection Date: October 19, 2000

LDC Report Date: December 13, 2000

Matrix: Soil

Parameters: Volatiles

Validation Level: Ogden Level 1, 2, & 3

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E0J200130

Sample Identification

C-2-207-20**	C-2-216-1
C-2-207-28**	C-2-216-1RE
C-2-208-10**	C-2-216-5
C-2-208-15*	C-2-216-5RE
C-2-208-20*	C-2-209-20MS
C-2-209-10*	C-2-209-20MSD
C-2-209-15*	
C-2-209-20*	
C-2-212-1*	
C-2-212-5*	
C-2-213-5	
C-2-213-10	
C-2-214-1	
C-2-214-1RE	
C-2-214-5	
C-2-214-5RE	
C-2-215-5	
C-2-215-5RE	
C-2-215-10	
C-2-215-10RE	

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 26 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
C-2-214-1RE C-2-214-5RE C-2-215-5RE C-2-215-10RE C-2-216-1RE	All TCL compounds	17	14	J (all detects) UJ (all non-detects)	A
C-2-216-5RE	All TCL compounds	18	14	J (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	All TCL compounds	Cooler temperature was reported at 21°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) R (all non-detects)	A

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/30/00	Acrolein tert-Butanol	0.01607 (≥0.05) 0.02369 (≥0.05)	C-2-207-20** C-2-207-28** C-2-208-10** C-2-208-15* C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* C-2-212-1* C-2-212-5* 0312517BLK 0311631BLK 0312518BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/31/00	Methyl-tert-butyl ether Vinyl acetate	28.8 174.7	C-2-208-10** C-2-208-15* 0311631BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/1/00	Methyl-tert-butyl ether	28.6	C-2-207-20** C-2-207-28** C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* 0312517BLK	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/31/00	Acrolein tert-Butanol	0.018 (≥0.05) 0.023 (≥0.05)	C-2-208-10** C-2-208-15* 0311631BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/1/00	Acrolein tert-Butanol	0.020 (≥0.05) 0.029 (≥0.05)	C-2-207-20** C-2-207-28** C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* 0312517BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/2/00	Acrolein tert-Butanol	0.016 (≥0.05) 0.023 (≥0.05)	C-2-212-1* C-2-212-5* 0312518BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
0313300BLK	11/4/00	Acetone	5.0 ug/Kg	C-2-214-1RE C-2-214-5RE C-2-215-5RE C-2-215-10RE C-2-216-1RE
0312517BLK	11/1/00	Acetone	7.1 ug/Kg	C-2-207-20** C-2-207-28** C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20*
0312518BLK	11/2/00	Acetone	7.5 ug/Kg	C-2-212-1* C-2-212-5* C-2-213-5 C-2-213-10 C-2-214-1 C-2-214-5 C-2-215-5 C-2-215-10 C-2-216-1 C-2-216-5
0311631BLK	10/31/00	Acetone	8.1 ug/Kg	C-2-208-10** C-2-208-15*
0312434BLK	11/6/00	Acetone	5.2 ug/Kg	C-2-216-5RE

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
C-2-214-1RE	Acetone	11 ug/ Kg	25U ug/ Kg
C-2-214-5RE	Acetone	11 ug/ Kg	25U ug/ Kg
C-2-215-5RE	Acetone	8.8 ug/ Kg	25U ug/ Kg
C-2-215-10RE	Acetone	6.7 ug/ Kg	25U ug/ Kg
C-2-216-1RE	Acetone	10 ug/ Kg	25U ug/ Kg
C-2-207-20**	Acetone	9.4 ug/ Kg	25U ug/ Kg
C-2-207-28**	Acetone	12 ug/ Kg	25U ug/ Kg
C-2-208-20*	Acetone	7.7 ug/ Kg	25U ug/ Kg
C-2-209-10*	Acetone	9.6 ug/ Kg	25U ug/ Kg
C-2-209-15*	Acetone	11 ug/ Kg	25U ug/ Kg
C-2-209-20*	Acetone	9.7 ug/ Kg	25U ug/ Kg
C-2-212-1*	Acetone	15 ug/ Kg	25U ug/ Kg
C-2-212-5*	Acetone	13 ug/ Kg	25U ug/ Kg
C-2-213-5	Acetone	17 ug/ Kg	25U ug/ Kg
C-2-213-10	Acetone	13 ug/ Kg	25U ug/ Kg
C-2-214-1	Acetone	15 ug/ Kg	25U ug/ Kg
C-2-214-5	Acetone	19 ug/ Kg	25U ug/ Kg
C-2-215-5	Acetone	17 ug/ Kg	25U ug/ Kg
C-2-215-10	Acetone	14 ug/ Kg	25U ug/ Kg
C-2-216-1	Acetone	18 ug/ Kg	25U ug/ Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
C-2-216-5	Acetone	15 ug/Kg	25U ug/Kg
C-2-208-10**	Acetone	12 ug/Kg	25U ug/Kg
C-2-208-15*	Acetone	16 ug/Kg	25U ug/Kg
C-2-216-5RE	Acetone	9.8 ug/Kg	25U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
C-2-214-1	1,2-Dichloroethane-d4	131 (70-130)	All TCL compounds	J (all detects)	A
C-2-215-5	1,2-Dichloroethane-d4	137 (70-130)	All TCL compounds	J (all detects)	A
C-2-215-10	1,2-Dichloroethane-d4	134 (70-130)	All TCL compounds	J (all detects)	A
C-2-216-5	1,2-Dichloroethane-d4	134 (70-130)	All TCL compounds	J (all detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIV. System Performance

The system performance was within validation criteria for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Data Qualification Summary - SDG E0J200130

SDG	Sample	Compound	Flag	A or P	Reason
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10** C-2-208-15* C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* C-2-212-1* C-2-212-5* C-2-213-5 C-2-213-10 C-2-214-1 C-2-214-1RE C-2-214-5 C-2-214-5RE C-2-215-5 C-2-215-5RE C-2-215-10 C-2-215-10RE C-2-216-1 C-2-216-1RE C-2-216-5 C-2-216-5RE	All TCL compounds	J (all detects) R (all non-detects)	A	Cooler temperature
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10** C-2-208-15* C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* C-2-212-1* C-2-212-5*	Acrolein tert-Butanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
E0J200130	C-2-208-10** C-2-208-15*	Methyl-tert-butyl ether Vinyl acetate	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E0J200130	C-2-207-20** C-2-207-28** C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20*	Methyl-tert-butyl ether	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10** C-2-208-15* C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* C-2-212-1* C-2-212-5*	Acrolein tert-Butanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
E0J200130	C-2-214-1 C-2-215-5 C-2-215-10 C-2-216-5	All TCL compounds	J (all detects)	A	Surrogate spikes (%R)

SDG	Sample	Compound	Flag	A or P	Reason

Boeing Redevelopment Corp., C-6 Facility
Volatiles - Laboratory Blank Data Qualification Summary - SDG E0J200130

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
E0J200130	C-2-214-1RE	Acetone	25U ug/ Kg	A
E0J200130	C-2-214-5RE	Acetone	25U ug/ Kg	A
E0J200130	C-2-215-5RE	Acetone	25U ug/ Kg	A
E0J200130	C-2-215-10RE	Acetone	25U ug/ Kg	A
E0J200130	C-2-216-1RE	Acetone	25U ug/ Kg	A
E0J200130	C-2-207-20**	Acetone	25U ug/ Kg	A
E0J200130	C-2-207-28**	Acetone	25U ug/ Kg	A
E0J200130	C-2-208-20*	Acetone	25U ug/ Kg	A
E0J200130	C-2-209-10*	Acetone	25U ug/ Kg	A
E0J200130	C-2-209-15*	Acetone	25U ug/ Kg	A
E0J200130	C-2-209-20*	Acetone	25U ug/ Kg	A
E0J200130	C-2-212-1*	Acetone	25U ug/ Kg	A
E0J200130	C-2-212-5*	Acetone	25U ug/ Kg	A
E0J200130	C-2-213-5	Acetone	25U ug/ Kg	A
E0J200130	C-2-213-10	Acetone	25U ug/ Kg	A
E0J200130	C-2-214-1	Acetone	25U ug/ Kg	A
E0J200130	C-2-214-5	Acetone	25U ug/ Kg	A
E0J200130	C-2-215-5	Acetone	25U ug/ Kg	A
E0J200130	C-2-215-10	Acetone	25U ug/ Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
E0J200130	C-2-216-1	Acetone	25U ug/ Kg	A
E0J200130	C-2-216-5	Acetone	25U ug/ Kg	A
E0J200130	C-2-208-10**	Acetone	25U ug/ Kg	A
E0J200130	C-2-208-15*	Acetone	25U ug/ Kg	A
E0J200130	C-2-216-5RE	Acetone	25U ug/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 18 through October 19, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Polychlorinated Biphenyls
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J200130

Sample Identification

C-2-207-20**
C-2-207-28**
C-2-208-10
C-2-208-15*
C-2-208-20*
C-2-209-10*
C-2-209-15*
C-2-209-20*
C-2-210-2
C-2-212-1
C-2-212-5
C-2-213-5
C-2-214-1
C-2-214-5
C-2-215-5
C-2-216-1
C-2-216-5
C-2-207-20MS
C-2-207-20MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

BOE-C6-0001710

Introduction

This data review covers 19 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	All TCL compounds	Cooler temperature was reported at 21°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

Retention time windows were evaluated and considered technically acceptable for samples on which a Ogden Level 3 review was performed. Raw data were not evaluated for the samples on which a Level 2 review was performed.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a Ogden Level 3 review was performed.

Raw data were not evaluated for the samples on which a Level 2 review was performed.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl

contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
C-2-216-1	Not specified	Tetrachloro-m-xylene	142 (60-140)	All TCL compounds	J (all detects)	P
C-2-216-5	Not specified	Tetrachloro-m-xylene	141 (60-140)	All TCL compounds	J (all detects)	P
E0J230000-359	Not specified	Tetrachloro-m-xylene	12 (60-140)	All TCL compounds	J (all detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

All target compound identifications were within validation criteria for samples on which

a Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Polychlorinated Biphenyls - Data Qualification Summary - SDG E0J200130

SDG	Sample	Compound	Flag	A or P	Reason
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10 C-2-208-15* C-2-208-20* C-2-209-10* C-2-209-15* C-2-209-20* C-2-210-2 C-2-212-1 C-2-212-5 C-2-213-5 C-2-214-1 C-2-214-5 C-2-215-5 C-2-216-1 C-2-216-5	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature
E0J200130	C-2-216-1 C-2-216-5	All TCL compounds	J (all detects)	P	Surrogate spikes (%R)

Boeing Redevelopment Corp., C-6 Facility
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG E0J200130

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Metals
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J130321

Sample Identification

C-2-150-5**
C-2-151-1**
C-2-151-5*
C-2-152-5*
C-2-153-5*
C-2-155-5*
C-2-156-1*
C-2-156-5*
C-2-156-10
C-2-157-1
C-2-157-5
C-2-157-10
C-2-159-1
C-2-159-5
C-2-159-10
C-2-162-1
C-2-162-5
C-2-164-5
C-2-150-5MS
C-2-150-5MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/ CCB/ PBs) was based on the maximum contaminant concentration in the ICB/ CCB/ PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Antimony Chromium	0.57 mg/ Kg 0.17 mg/ Kg	All samples in SDG E0J130321
ICB/ CCB	Antimony	4.19 ug/ L	All samples in SDG E0J130321

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/ CCB/ PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
C-2-150-5**	Antimony	0.35 mg/ Kg	0.35U mg/ Kg
C-2-151-1**	Antimony	0.55 mg/ Kg	0.55U mg/ Kg
C-2-153-5*	Antimony	0.38 mg/ Kg	0.38U mg/ Kg
C-2-156-1*	Antimony	0.46 mg/ Kg	0.46U mg/ Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
C-2-156-10	Antimony	0.40 mg/ Kg	0.40U mg/ Kg
C-2-159-10	Antimony	0.21 mg/ Kg	0.21U mg/ Kg
C-2-162-1	Antimony	0.42 mg/ Kg	0.42U mg/ Kg

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
C-2-150-5MS/ MSD (All samples in SDG E0J130321)	Antimony	23 (75-115)	24 (75-115)	-	J (all detects) R (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Metals - Data Qualification Summary - SDG E0J130321

SDG	Sample	Analyte	Flag	A or P	Reason
E0J130321	C-2-150-5** C-2-151-1** C-2-151-5* C-2-152-5* C-2-153-5* C-2-155-5* C-2-156-1* C-2-156-5* C-2-156-10 C-2-157-1 C-2-157-5 C-2-157-10 C-2-159-1 C-2-159-5 C-2-159-10 C-2-162-1 C-2-162-5 C-2-164-5	Antimony	J (all detects) R (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Facility
Metals - Laboratory Blank Data Qualification Summary - SDG E0J130321

SDG	Sample	Analyte	Modified Final Concentration	A or P
E0J130321	C-2-150-5**	Antimony	0.35U mg/ Kg	A
E0J130321	C-2-151-1**	Antimony	0.55U mg/ Kg	A
E0J130321	C-2-153-5*	Antimony	0.38U mg/ Kg	A
E0J130321	C-2-156-1*	Antimony	0.46U mg/ Kg	A
E0J130321	C-2-156-10	Antimony	0.40U mg/ Kg	A
E0J130321	C-2-159-10	Antimony	0.21U mg/ Kg	A
E0J130321	C-2-162-1	Antimony	0.42U mg/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Facility

Collection Date: October 12, 2000

LDC Report Date: December 11, 2000

Matrix: Soil

Parameters: Metals

Validation Level: Ogden Level 1, 2, & 3

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E0J120324

Sample Identification

C-2-139-2**	C-2-139-2MS
C-2-139-5**	C-2-139-2MSD
C-2-139-10	
C-2-140-1*	
C-2-140-5*	
C-2-141-5*	
C-2-141-10*	
C-2-142-1*	
C-2-142-5*	
C-2-143-5	
C-2-143-10	
C-2-144-1	
C-2-144-5	
C-2-144-10	
C-2-144-15	
C-2-146-1	
C-2-146-5	
C-2-147-5	
C-2-148-5	
2-149-5	

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

BOE-C6-0001724

Introduction

This data review covers 22 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/ CCB/ PBs) was based on the maximum contaminant concentration in the ICB/ CCB/ PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Antimony Chromium	0.24 mg/ Kg 0.26 mg/ Kg	C-2-139-2** C-2-139-5** C-2-139-10 C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5 C-2-143-10 C-2-144-1 C-2-144-5 C-2-144-10 C-2-144-15 C-2-146-1 C-2-146-5 C-2-147-5 C-2-148-5
ICB/ CCB	Antimony Selenium	4.4 ug/ L 4.38 ug/ L	C-2-139-2** C-2-139-5** C-2-139-10 C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5 C-2-143-10 C-2-144-1 C-2-144-5

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
			C-2-144-10 C-2-144-15 C-2-146-1 C-2-146-5 C-2-147-5 C-2-148-5
PB (prep blank)	Chromium	0.12 mg/ Kg	2-149-5
ICB/ CCB	Molybdenum	5.23 ug/ L	2-149-5

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/ CCB/ PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
C-2-139-2**	Antimony	0.26 mg/ Kg	0.26U mg/ Kg
C-2-139-5**	Antimony	0.26 mg/ Kg	0.26U mg/ Kg
C-2-140-1*	Antimony	0.25 mg/ Kg	0.25U mg/ Kg
C-2-141-10*	Antimony	0.34 mg/ Kg	0.34U mg/ Kg
C-2-142-1*	Antimony	0.40 mg/ Kg	0.40U mg/ Kg
C-2-142-5*	Antimony	0.39 mg/ Kg	0.39U mg/ Kg
C-2-144-1	Antimony	0.47 mg/ Kg	0.47U mg/ Kg
C-2-144-10	Antimony	0.53 mg/ Kg	0.53U mg/ Kg
C-2-144-15	Antimony	0.38 mg/ Kg	0.38U mg/ Kg
C-2-146-5	Antimony	0.42 mg/ Kg	0.42U mg/ Kg
2-149-5	Molybdenum	1.3 mg/ Kg	1.3U mg/ Kg

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
2-149-5	All TAL metals	No MS/MSD associated with these samples.	MS/MSD required.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
C-2-139-2MS/MSD (C-2-139-2** C-2-139-5** C-2-139-10 C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5 C-2-143-10 C-2-144-1 C-2-144-5 C-2-144-10 C-2-144-15 C-2-146-1 C-2-146-5 C-2-147-5 C-2-148-5)	Antimony Zinc	34 (75-115) 70 (80-120)	33 (75-115) -	- -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Metals - Data Qualification Summary - SDG E0J120324

SDG	Sample	Analyte	Flag	A or P	Reason
E0J120324	2-149-5	All TAL metals	None	P	Matrix spike/ Matrix spike duplicates
E0J120324	C-2-139-2** C-2-139-5** C-2-139-10 C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-142-1* C-2-142-5* C-2-143-5 C-2-143-10 C-2-144-1 C-2-144-5 C-2-144-10 C-2-144-15 C-2-146-1 C-2-146-5 C-2-147-5 C-2-148-5	Antimony Zinc	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Facility
Metals - Laboratory Blank Data Qualification Summary - SDG E0J120324

			Modified Final	
E0J120324	C-2-139-2**	Antimony	0.26U mg/ Kg	A
E0J120324	C-2-139-5**	Antimony	0.26U mg/ Kg	A
E0J120324	C-2-140-1*	Antimony	0.25U mg/ Kg	A
E0J120324	C-2-141-10*	Antimony	0.34U mg/ Kg	A
E0J120324	C-2-142-1*	Antimony	0.40U mg/ Kg	A
E0J120324	C-2-142-5*	Antimony	0.39U mg/ Kg	A
E0J120324	C-2-144-1	Antimony	0.47U mg/ Kg	A
E0J120324	C-2-144-10	Antimony	0.53U mg/ Kg	A
E0J120324	C-2-144-15	Antimony	0.38U mg/ Kg	A
E0J120324	C-2-146-5	Antimony	0.42U mg/ Kg	A
E0J120324	2-149-5	Molybdenum	1.3U mg/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 12, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	pH
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J120324

Sample Identification

C-2-146-1**
C-2-146-5*
C-2-146-10

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 3 soil samples listed on the cover sheet. The analyses were per EPA SW 846 Method 9045 for pH.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

III. Blanks

Not applicable to this method.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E0J120324	pH	No DUP analysis associated with these samples.	DUP analysis required.	None	P

b. Laboratory Control Samples

Not applicable to this method.

V. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
pH - Data Qualification Summary - SDG E0J120324

SDG	Sample	Analyte	Flag	A or P	Reason
E0J120324	C-2-146-1** C-2-146-5* C-2-146-10	pH	None	P	Duplicate sample analysis

Boeing Redevelopment Corp., C-6 Facility
pH - Laboratory Blank Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	pH
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J130321

Sample Identification

C-2-153-5**
C-2-156-1*
C-2-156-5*
C-2-156-10*
C-2-157-1
C-2-157-5
C-2-157-10
C-2-159-1
C-2-159-5
C-2-159-10

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 10 soil samples listed on the cover sheet. The analyses were per EPA SW 846 Method 9045 for pH.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Samples indicated by a double asterisk on the front cover underwent a Ogden Level 3 review. A Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

III. Blanks

Not applicable to this method.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E0J130321	pH	No DUP analysis associated with these samples.	DUP analysis required.	None	P

b. Laboratory Control Samples

Not applicable to this method.

V. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Level 2 criteria.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
pH - Data Qualification Summary - SDG E0J130321

SDG	Sample	Analyte	Flag	A or P	Reason
E0J130321	C-2-153-5** C-2-156-1* C-2-156-5* C-2-156-10* C-2-157-1 C-2-157-5 C-2-157-10 C-2-159-1 C-2-159-5 C-2-159-10	pH	None	P	Duplicate sample analysis

Boeing Redevelopment Corp., C-6 Facility
pH - Laboratory Blank Data Qualification Summary - SDG E0J130321

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 12, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J120324

Sample Identification

C-2-144-1*
C-2-144-5
C-2-144-10
C-2-144-15
C-2-146-1**
C-2-146-5*
C-2-144-1MS
C-2-144-1MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Sample Result Verification

All sample result verifications were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Hexavalent Chromium - Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Facility
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Gasoline (C6-C8)
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J130321

Sample Identification

C-2-150-5**
C-2-150-10
C-2-151-1**
C-2-151-5*
C-2-152-5*
C-2-152-10*
C-2-152-15
C-2-153-5*
C-2-162-1
C-2-162-5
C-2-163-1
C-2-163-5
C-2-164-5
C-2-150-5MS
C-2-150-5MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0%QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
E0J30000-276B	10/18/00	TPH as gasoline (C6-C8)	0.3 mg/Kg	All samples in SDG E0J13021

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
C-2-150-5**	TPH as gasoline (C6-C8)	0.28 mg/Kg	1.0U mg/Kg
C-2-150-10	TPH as gasoline (C6-C8)	0.21 mg/Kg	1.0U mg/Kg
C-2-151-1**	TPH as gasoline (C6-C8)	0.20 mg/Kg	1.0U mg/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
C-2-151-5*	TPH as gasoline (C6-C8)	0.28 mg/ Kg	1.0U mg/ Kg
C-2-152-5*	TPH as gasoline (C6-C8)	0.24 mg/ Kg	1.0U mg/ Kg
C-2-152-10*	TPH as gasoline (C6-C8)	0.23 mg/ Kg	1.0U mg/ Kg
C-2-152-15	TPH as gasoline (C6-C8)	0.23 mg/ Kg	1.0U mg/ Kg
C-2-153-5*	TPH as gasoline (C6-C8)	0.30 mg/ Kg	1.0U mg/ Kg
C-2-162-1	TPH as gasoline (C6-C8)	0.27 mg/ Kg	1.0U mg/ Kg
C-2-162-5	TPH as gasoline (C6-C8)	0.25 mg/ Kg	1.0U mg/ Kg
C-2-163-1	TPH as gasoline (C6-C8)	0.28 mg/ Kg	1.0U mg/ Kg
C-2-163-5	TPH as gasoline (C6-C8)	0.32 mg/ Kg	1.0U mg/ Kg
C-2-164-5	TPH as gasoline (C6-C8)	0.25 mg/ Kg	1.0U mg/ Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG E0J130321

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG E0J130321

SDG	Sample	Compound	Modified Final Concentration	A or P
E0J130321	C-2-150-5**	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-150-10	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-151-1**	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-151-5*	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-152-5*	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-152-10*	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-152-15	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-153-5*	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-162-1	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-162-5	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-163-1	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-163-5	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A
E0J130321	C-2-164-5	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 12, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Gasoline (C6-C8)
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J120324

Sample Identification

C-2-139-2**
C-2-139-5**
C-2-139-10*
C-2-140-1*
C-2-140-5*
C-2-141-5*
C-2-141-10*
C-2-142-1
C-2-142-5
C-2-143-5
C-2-143-10
C-2-145-6
C-2-147-5
C-2-147-10
C-2-147-15
C-2-148-5
2-149-5
2-149-5-5MS
2-149-5-5MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 19 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 18 through October 19, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Gasoline (C6-C8)
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J200130

Sample Identification

C-2-207-20**
C-2-207-28**
C-2-208-10
C-2-208-15*
C-2-208-20*
C-2-212-1*
C-2-212-5*
C-2-213-5
C-2-214-1
C-2-214-5
C-2-215-5
C-2-216-1
C-2-216-5

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	TPH as gasoline	Cooler temperature was reported at 21°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) R (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	TPH as gasoline (C6-C8)	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG E0J200130

SDG	Sample	Compound	Flag	A or P	Reason
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10 C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5* C-2-213-5 C-2-214-1 C-2-214-5 C-2-215-5 C-2-216-1 C-2-216-5	TPH as gasoline (C6-C8)	J (all detects) R (all non-detects)	A	Cooler temperature
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10 C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5* C-2-213-5 C-2-214-1 C-2-214-5 C-2-215-5 C-2-216-1 C-2-216-5	TPH as gasoline (C6-C8)	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG E0J200130

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 13, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J130321

Sample Identification

C-2-150-5**
C-2-150-10
C-2-151-1**
C-2-151-5*
C-2-152-5*
C-2-152-10*
C-2-152-15
C-2-153-5*
C-2-162-1
C-2-162-5
C-2-163-1
C-2-163-5
C-2-164-5
C-2-150-5MS
C-2-150-5MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Compound	%D	Affected Compound	Associated Samples	Flag	A or P
10/29/00 (01:15)	TPH as diesel (C10-C24)	26.33	TPH as diesel (C10-C24)	C-2-150-5MS C-2-150-5MSD	J (all detects) UJ (all non-detects)	P
10/29/00 (01:45)	TPH as C36-C39 TPH as C40+	21.89 24.80	TPH as C36-C39 TPH as C40+	C-2-150-5** C-2-152-5* C-2-152-10* E0J160000-6058	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
10/29/00 (7:46)	TPH as C36-C39 TPH as C40+ TPH as C20-C23 TPH as C18-C19 TPH as C24-C27 TPH as C28-C31 TPH as C32-C35	35.08 38.68 15.37 22.58 15.26 15.45 21.59	TPH as C36-C39 TPH as C40+ TPH as C20-C23 TPH as C18-C19 TPH as C24-C27 TPH as C28-C31 TPH as C32-C35	C-2-153-5*	J (all detects) UJ (all non-detects)	P

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples C-2-163-1 and C-2-163-5. Since the sample was diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E0J130321

SDG	Sample	Compound	Flag	A or P	Reason
E0J130321	C-2-150-5** C-2-152-5* C-2-152-10*	TPH as C36-C39 TPH as C40+	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Calibration verification (%D)
E0J130321	C-2-153-5*	TPH as C36-C39 TPH as C40+ TPH as C20-C23 TPH as C18-C19 TPH as C24-C27 TPH as C28-C31 TPH as C32-C35	J (all detects) UJ (all non-detects)	P	Calibration verification (%D)

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E0J130321

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 13, 2000
LDC Report Date:	December 11, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J120324

Sample Identification

C-2-139-2**
C-2-139-5**
C-2-139-10*
C-2-140-1*
C-2-140-5*
C-2-141-5*
C-2-141-10*
C-2-142-1
C-2-142-5
C-2-143-5
C-2-143-10
C-2-145-6
C-2-147-5
C-2-147-10
C-2-147-15
C-2-148-5
2-149-5
C-2-139-2MS
C-2-139-2MSD

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 19 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Compound	%D	Affected Compound	Associated Samples	Flag	A or P
10/29/00 (04:27)	TPH as C36-C39 TPH as C40+	27.38 31.41	TPH as C36-C39 TPH as C40+	C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10*	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
10/30/00 (01:17)	TPH as C40+	18.01	TPH as C40+	C-2-139-2**	J (all detects) UJ (all non-detects)	A
10/27/00 (03:38)	TPH as diesel	26.63	TPH as diesel	C-2-139-2MS C-2-139-2MSD	J (all detects) UJ (all non-detects)	P
10/27/00 (04:17)	TPH as C36-C39 TPH as C40+	15.58 19.52	TPH as C36-C39 TPH as C40+	C-2-139-5** C-2-139-10* E0J130000-517	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample C-2-140-1*. Since the sample was diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Compound	Flag	A or P
C-2-139-2MS/MSD (C-2-139-2**)	TPH as diesel	154 (60-130)	151 (60-130)	-	TPH as extractables	J (all detects)	A

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by

Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E0J120324

SDG	Sample	Compound	Flag	A or P	Reason
E0J120324	C-2-140-1* C-2-140-5* C-2-141-5* C-2-141-10* C-2-139-5** C-2-139-10*	TPH as C36-C39 TPH as C40+	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Calibration verification (%D)
E0J120324	C-2-139-2**	TPH as C40+	J (all detects) UJ (all non-detects)	A	Calibration verification (%D)
E0J120324	C-2-139-2**	TPH as extractables	J (all detects) UJ (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E0J120324

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Facility
Collection Date:	October 18 through October 19, 2000
LDC Report Date:	December 13, 2000
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Ogden Level 1, 2, & 3
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0J200130

Sample Identification

C-2-207-20**
C-2-207-28**
C-2-208-10
C-2-208-15*
C-2-208-20*
C-2-212-1*
C-2-212-5*
C-2-213-5
C-2-214-1
C-2-214-5
C-2-215-5
C-2-216-1
C-2-216-5

** Indicates sample underwent Level 3 review
* Indicates sample underwent Level 2 review
All other samples underwent Level 1 review

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent Ogden Level 3 review. Ogden Level 2 review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	TPH as extractables	Cooler temperature was reported at 21°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/8/00	TPH as C36-C39 TPH as C40+	21.11 26.47	C-2-207-20** C-2-207-28** C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5* E0J23000-354	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples C-2-163-1 and C-2-163-5. Since the sample was diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0J200130	TPH as extractables	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which Ogden Level 3 review was performed.

Sample results were reported on a wet weight basis.

Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VII. System Performance

The system performance was within validation criteria for samples on which Ogden Level 3 review was performed. Raw data were not evaluated for the samples reviewed by Ogden Level 2 criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E0J200130

SDG	Sample	Compound	Flag	A or P	Reason
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10 C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5* C-2-213-5 C-2-214-1 C-2-214-5 C-2-215-5 C-2-216-1 C-2-216-5	TPH as extractables	J (all detects) UJ (all non-detects)	A	Cooler temperature
E0J200130	C-2-207-20** C-2-207-28** C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5*	TPH as C36-C39 TPH as C40+	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Calibration verification (%D)
E0J200130	C-2-207-20** C-2-207-28** C-2-208-10 C-2-208-15* C-2-208-20* C-2-212-1* C-2-212-5* C-2-213-5 C-2-214-1 C-2-214-5 C-2-215-5 C-2-216-1 C-2-216-5	TPH as extractables	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Facility
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E0J200130

No Sample Data Qualified in this SDG

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Haley & Aldrich, Inc.
9040 Friars Road, Suite 202
San Diego, CA 92108
ATTN: Mr. Michael McDowell

August 13, 2001

SUBJECT: Boeing C-6 Site, Data Validation

Dear Mr. McDowell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 18, 2001. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 6779:

SDG #	Fraction
E0L160148, E0L180217, E1A030129, E1D020174, E1D160201	Volatiles, Semivolatiles, Chlorinated Pesticides, Metals, Total Volatile Fuel Hydrocarbons, TPH as Extractables, Wet Chemistry, Hexavalent Chromium

The data validation was performed under Tier 1 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996

Please feel free to contact us if you have any questions.

Sincerely,

for

Richard M. Amano
President/Principal Chemist

6779COV.HA

Attachment 1

LDC #6779 (Haley & Aldrich/Boeing C-6 Site)

LDC	SDG#	DATE REC'D	DATE DUE	VOA (8260B)		SVOA (8270C)		PCBs (8082)		PAH (8310)		Metals (SW846)		TVPH (8015)		TPH-E (8015)		CN' (335.2)		pH (9045C)		CRVI (7196A)															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	E0L160148	7-18-01	8-1-01	2	20	-	-	0	13	-	-	0	14	0	17	0	17	-	-	-	-	-	-	Tier 1 (Ogden QAPP)													
B	E0L180217	7-18-01	8-1-01	0	20	-	-	-	-	-	-	0	13	0	18	0	18	0	3	0	3	-	-	Tier 1 (Ogden QAPP)													
C	E1A030129	7-18-01	8-1-01	2	28	-	-	-	-	-	-	0	19	0	16	0	16	-	-	-	-	-	-	Tier 1 (Ogden QAPP)													
D	E1D020174	7-18-01	8-1-01	-	-	0	3	0	3	0	3	-	-	-	-	-	-	-	-	-	-	0	1	Tier 1 (Ogden QAPP)													
E	E1D160201	7-18-01	8-1-01	0	7	-	-	0	6	-	-	0	7	0	7	0	7	-	-	-	-	-	-	Tier 1 (Ogden QAPP)													
Total				4	75	0	3	0	22	0	3	0	53	0	58	0	58	0	3	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

T sample counts do not inclute MS/MSD, and DUPs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 15, 2000
LDC Report Date:	August 1, 2001
Matrix:	Soil/Water
Parameters:	Volatiles
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L160148

Sample Identification

C-2-278-5'	RINSATE
C-2-278-10'	TRIP BLANK
C-2-279-5'	C-2-278-5'MS
C-2-279-10'	C-2-278-5'MSD
C-2-280-5'	C-2-290-10'MS
C-2-280-10'	C-2-290-10'MSD
C-2-281-5'	
C-2-281-10'	
C-2-281-15'	
C-2-282-5'	
C-2-282-10'	
C-2-282-15'	
C-2-283-5'	
C-2-283-10'	
C-2-284-5'	
C-2-284-10'	
C-2-285-5'	
C-2-290-5'	
C-2-290-10'	
C-2-290-15'	

Introduction

This data review covers 24 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0L160148	All TCL compounds	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

Internal standard areas and retention times were not reviewed for Tier I.

XI. Target Compound Identifications

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds (TICs) were not reviewed for Tier I.

XIV. System Performance

System performance data were not reviewed for Tier I.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample "RINSATE" was identified as a rinsate. No volatile contaminants were found in this blank.

Sample "TRIP BLANK" was identified as a trip blank. No volatile contaminants were found in this blank.

Boeing Redevelopment Corp., C-6 Site
Volatiles - Data Qualification Summary - SDG E0L160148

SDG	Sample	Compound	Flag	A or P	Reason
E0L160148	C-2-278-5' C-2-278-10' C-2-279-5' C-2-279-10' C-2-280-5' C-2-280-10' C-2-281-5' C-2-281-10' C-2-281-15' C-2-282-5' C-2-282-10' C-2-282-15' C-2-283-5' C-2-283-10' C-2-284-5' C-2-284-10' C-2-285-5' C-2-290-5' C-2-290-10' C-2-290-15' RINSATE TRIP BLANK	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG E0L160148

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 15, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L160148

Sample Identification

C-2-278-5'
C-2-278-10'
C-2-279-5'
C-2-279-10'
C-2-280-5'
C-2-280-10'
C-2-281-5'
C-2-281-10'
C-2-281-15'
C-2-282-5'
C-2-283-5'
C-2-284-5'
C-2-285-5'
C-2-290-5'
C-2-278-5'MS
C-2-278-5'MSD

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the preparation blanks (PBs) was based on the maximum contaminant concentration in the PBs in the analysis of each analyte. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.10 mg/Kg	All samples in SDG E0L160148

Sample concentrations were compared to the maximum contaminant concentrations detected in the PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check data was not provided and therefore not reviewed.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E0L160148	All ICP metals	No MS associated with these samples.	MS required.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG E0L160148

SDG	Sample	Analyte	Flag	A or P	Reason
E0L160148	C-2-278-5'	Aluminum	None	P	Matrix spike/ Matrix spike duplicates
	C-2-278-10'	Antimony	None		
	C-2-279-5'	Arsenic	None		
	C-2-279-10'	Barium	None		
	C-2-280-5'	Beryllium	None		
	C-2-280-10'	Cadmium	None		
	C-2-281-5'	Chromium	None		
	C-2-281-10'	Cobalt	None		
	C-2-281-15'	Copper	None		
	C-2-282-5'	Iron	None		
	C-2-283-5'	Lead	None		
	C-2-284-5'	Nickel	None		
	C-2-285-5'	Selenium	None		
	C-2-290-5'	Silver	None		
		Thallium	None		
		Vanadium	None		
		Zinc	None		
		Molybdenum	None		

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG E0L160148

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 15, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L160148

Sample Identification

C-2-278-5'
C-2-278-10'
C-2-279-5'
C-2-279-10'
C-2-280-5'
C-2-280-10'
C-2-281-5'
C-2-281-10'
C-2-281-15'
C-2-282-5'
C-2-282-10'
C-2-282-15'
C-2-283-5'
C-2-284-5'
C-2-290-5'
C-2-290-10'
C-2-290-15'
C-2-281-10'MS
C-2-281-10'MSD
C-2-290-15'MS
C-2-290-15'MSD

Introduction

This data review covers 21 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0L160148	Total volatile petroleum hydrocarbons	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total volatile petroleum hydrocarbon contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG E0L160148

SDG	Sample	Compound	Flag	A or P	Reason
E0L160148	C-2-278-5' C-2-278-10' C-2-279-5' C-2-279-10' C-2-280-5' C-2-280-10' C-2-281-5' C-2-281-10' C-2-281-15' C-2-282-5' C-2-282-10' C-2-282-15' C-2-283-5' C-2-284-5' C-2-290-5' C-2-290-10' C-2-290-15'	Total volatile petroleum hydrocarbons	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E0L160148

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 15, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L160148

Sample Identification

C-2-278-5'
C-2-278-10'
C-2-279-5'
C-2-279-10'
C-2-280-5'
C-2-280-10'
C-2-281-5'
C-2-281-10'
C-2-281-15'
C-2-282-5'
C-2-282-10'
C-2-282-15'
C-2-283-5'
C-2-284-5'
C-2-290-5'
C-2-290-10'
C-2-290-15'

Introduction

This data review covers 17 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E0L160148	TPH as extractables	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample C-2-281-5'. Since the sample was diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent

recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E0L160148

SDG	Sample	Compound	Flag	A or P	Reason
E0L160148	C-2-278-5' C-2-278-10' C-2-279-5' C-2-279-10' C-2-280-5' C-2-280-10' C-2-281-5' C-2-281-10' C-2-281-15' C-2-282-5' C-2-282-10' C-2-282-15' C-2-283-5' C-2-284-5' C-2-290-5' C-2-290-10' C-2-290-15'	TPH as extractables	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E0L160148

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: December 18, 2000

LDC Report Date: July 30, 2001

Matrix: Soil

Parameters: Volatiles

Validation Level: Tier 1

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E0L180217

Sample Identification

C-2-298-5
C-2-298-10
C-2-298-15
C-2-299-5
C-2-299-10
C-2-301-5
C-2-301-10
C-2-301-15
C-2-302-1
C-2-302-5
C-2-302-10
C-2-303-5
C-2-303-10
C-2-303-15
C-2-304-5
C-2-304-10
C-2-304-15
C-2-305-10
C-2-305-15
C-2-305-20
C-2-299-5MS
C-2-299-5MSD

Introduction

This data review covers 22 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

Internal standard areas and retention times were not reviewed for Tier I.

XI. Target Compound Identifications

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds (TICs) were not reviewed for Tier I.

XIV. System Performance

System performance data were not reviewed for Tier I.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Volatiles - Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 18, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L180217

Sample Identification

C-2-298-5
C-2-298-10
C-2-298-15
C-2-301-5
C-2-302-1
C-2-302-5
C-2-303-5
C-2-304-5
C-2-304-10
C-2-304-15
C-2-305-10
C-2-305-15
C-2-305-20
C-2-305-15MS
C-2-305-15MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the preparation blanks (PBs) was based on the maximum contaminant concentration in the PBs in the analysis of each analyte. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB1 (prep blank)	Antimony Chromium	0.29 mg/Kg 0.11 mg/Kg	C-2-298-5 C-2-298-10 C-2-298-15 C-2-301-5 C-2-302-1 C-2-302-5 C-2-303-5 C-2-304-5 C-2-304-10 C-2-304-15
PB2 (prep blank)	Chromium	0.29 mg/Kg	C-2-305-10 C-2-305-15 C-2-305-20

Sample concentrations were compared to the maximum contaminant concentrations detected in the PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
C-2-298-5	Antimony	0.52 mg/Kg	0.52U mg/Kg
C-2-298-15	Antimony	0.54 mg/Kg	0.54U mg/Kg
C-2-301-5	Antimony	0.74 mg/Kg	0.74U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
C-2-302-1	Antimony	0.56 mg/ Kg	0.56U mg/ Kg
C-2-302-5	Antimony	0.71 mg/ Kg	0.71U mg/ Kg
C-2-303-5	Antimony	0.54 mg/ Kg	0.54U mg/ Kg
C-2-304-5	Antimony	0.72 mg/ Kg	0.72U mg/ Kg
C-2-304-10	Antimony	0.32 mg/ Kg	0.32U mg/ Kg
C-2-304-15	Antimony	0.61 mg/ Kg	0.61U mg/ Kg

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check data was not provided and therefore not reviewed.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E0L180217	Mercury	No MS/ MSD associated with these samples.	MS/ MSD required.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
C-2-298-10MS/ MSD (C-2-305-10 C-2-305-15 C-2-305-20)	Antimony	20 (75-125)	19 (75-125)	-	J (all detects) R (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG E0L180217

SDG	Sample	Analyte	Flag	A or P	Reason
E0L180217	C-2-298-5 C-2-298-10 C-2-298-15 C-2-301-5 C-2-302-1 C-2-302-5 C-2-303-5 C-2-304-5 C-2-304-10 C-2-304-15 C-2-305-10 C-2-305-15 C-2-305-20	Mercury	None	P	Matrix spike/ Matrix spike duplicates
E0L180217	C-2-305-10 C-2-305-15 C-2-305-20	Antimony	J (all detects) R (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG E0L180217

SDG	Sample	Analyte	Modified Final Concentration	A or P
E0L180217	C-2-298-5	Antimony	0.52U mg/ Kg	A
E0L180217	C-2-298-15	Antimony	0.54U mg/ Kg	A
E0L180217	C-2-301-5	Antimony	0.74U mg/ Kg	A
E0L180217	C-2-302-1	Antimony	0.56U mg/ Kg	A
E0L180217	C-2-302-5	Antimony	0.71U mg/ Kg	A
E0L180217	C-2-303-5	Antimony	0.54U mg/ Kg	A
E0L180217	C-2-304-5	Antimony	0.72U mg/ Kg	A
E0L180217	C-2-304-10	Antimony	0.32U mg/ Kg	A
E0L180217	C-2-304-15	Antimony	0.61U mg/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 18, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Cyanide & pH
Validation Level:	Tier I
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L180217

Sample Identification

C-2-302-1
C-2-302-5
C-2-302-10
C-2-302-1MS
C-2-302-1MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 335.2 for Cyanide, and EPA SW 846 Method 9045C for pH.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No cyanide contaminants were found in the method blanks.

Not applicable to pH analysis.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E0L180217	Cyanide pH	No DUP analysis associated with these samples.	DUP analysis required.	None None	P

b. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent

recoveries (%R) were within QC limits.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Cyanide & pH - Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Cyanide & pH - Laboratory Blank Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 18, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L180217

Sample Identification

C-2-298-5
C-2-298-10
C-2-298-15
C-2-299-5
C-2-299-10
C-2-301-5
C-2-301-10
C-2-301-15
C-2-302-10
C-2-303-5
C-2-303-10
C-2-303-15
C-2-304-5
C-2-304-10
C-2-304-15
C-2-305-10
C-2-305-15
C-2-305-20

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total volatile petroleum hydrocarbon contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	December 18, 2000
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E0L180217

Sample Identification

C-2-298-5
C-2-298-10
C-2-298-15
C-2-299-5
C-2-299-10
C-2-301-5
C-2-301-10
C-2-301-15
C-2-302-10
C-2-303-5
C-2-303-10
C-2-303-15
C-2-304-5
C-2-304-10
C-2-304-15
C-2-305-10
C-2-305-15
C-2-305-20
C-2-298-5MS
C-2-298-5MSD

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E0L180217

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: January 2, 2001

LDC Report Date: July 30, 2001

Matrix: Soil

Parameters: Volatiles

Validation Level: Tier 1

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E1A030129

Sample Identification

J-2-5	N-4-5
J-2-10	N-4-10
J-2-15	N-4-15
J-6-5	N-4-20
J-6-10	N-4-30
J-6-15	P-20-1-5
L-5-5	P-20-1-10
L-5-10	P-20-1-15
L-5-15	TB
L-5-20	RINSATE
L-5-30	J-2-5MS
M-5-5	J-2-5MSD
M-5-10	J-6-10MS
M-5-15	J-6-10MSD
M-5-20	M-5-5MS
M-5-30	M-5-5MSD
P-5-5	P-5-15MS
P-5-10	P-5-15MSD
P-5-15	
P-5-20	

Introduction

This data review covers 36 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

Internal standard areas and retention times were not reviewed for Tier I.

XI. Target Compound Identifications

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds (TICs) were not reviewed for Tier I.

XIV. System Performance

System performance data were not reviewed for Tier I.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample "RINSATE" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
RINSATE	Acetone	3.3

Sample TB was identified as a trip blank. No volatile contaminants were found in this blank.

Boeing Redevelopment Corp., C-6 Site
Volatiles - Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: January 2, 2001

LDC Report Date: July 30, 2001

Matrix: Soil

Parameters: Metals

Validation Level: Tier 1

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E1A030129

Sample Identification

J-2-5	J-2-5MSD
J-2-10	J-2-10MS
J-2-15	J-2-10MSD
J-6-5	
J-6-10	
J-6-15	
L-5-5	
L-5-10	
L-5-15	
L-5-20	
L-5-30	
N-4-5	
N-4-10	
N-4-15	
N-4-20	
N-4-30	
P-20-1-5	
P-20-1-10	
P-20-1-15	
J-2-5MS	

Introduction

This data review covers 23 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the preparation blanks (PBs) was based on the maximum contaminant concentration in the PBs in the analysis of each analyte. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.22 mg/Kg	All samples in SDG E1A030129

Sample concentrations were compared to the maximum contaminant concentrations detected in the PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check data was not provided and therefore not reviewed.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
J-2-5 J-2-15 J-6-5 J-6-10 J-6-15 L-5-5 L-5-10 L-5-15	All TAL metals	No MS/MSD associated with these samples.	MS/MSD required.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
J-2-10MS/MSD (J-2-10 L-5-20 L-5-30 N-4-5 N-4-10 N-4-15 N-4-20 N-4-30 P-20-1-5 P-20-1-10 P-20-1-15)	Antimony	19 (80-120)	18 (80-120)	-	J (all detects) R (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG E1A030129

SDG	Sample	Analyte	Flag	A or P	Reason
E1A030129	J-2-5 J-2-15 J-6-5 J-6-10 J-6-15 L-5-5 L-5-10 L-5-15	All TAL metals	None	P	Matrix spike/ Matrix spike duplicates
E1A030129	J-2-10 L-5-20 L-5-30 N-4-5 N-4-10 N-4-15 N-4-20 N-4-30 P-20-1-5 P-20-1-10 P-20-1-15	Antimony	J (all detects) R (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: January 2, 2001

LDC Report Date: July 30, 2001

Matrix: Soil

Parameters: Total Volatile Petroleum Hydrocarbons

Validation Level: Tier 1

Laboratory: Severn Trent Laboratories

Sample Delivery Group (SDG): E1A030129

Sample Identification

J-2-5
J-2-10
J-2-15
J-6-5
J-6-10
J-6-15
L-5-5
L-5-10
L-5-15
L-5-20
L-5-30
N-4-5
N-4-10
N-4-15
N-4-20
N-4-30
N-4-30MS
N-4-30MSD

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total volatile petroleum hydrocarbon contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	January 2, 2001
LDC Report Date:	August 1, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1A030129

Sample Identification

J-2-5
J-2-10
J-2-15
J-6-5
J-6-10
J-6-15
L-5-5
L-5-10
L-5-15
L-5-20
L-5-30
N-4-5
N-4-10
N-4-15
N-4-20
N-4-30
J-2-5MS
J-2-5MSD

Introduction

This data review covers 17 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E1A030129

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 21, 2001
LDC Report Date:	August 1, 2001
Matrix:	Soil
Parameters:	Semivolatiles
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D020174

Sample Identification

BUILD_20_M_23_032101_1
BUILD_20_L_23_032101_2
BUILD_20_M_23_032201_7
BUILD_20_M_23_032101_1MS
BUILD_20_M_23_032101_1MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D020174	All TCL compounds	Cooler temperature was reported at 18°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample BUILD_20_L_23_032101_2 . Since the sample was diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent

recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

Internal standard areas and retention times were not reviewed for Tier I.

XI. Target Compound Identifications

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds (TICs) were not reviewed for Tier I.

XIV. System Performance

System performance data were not reviewed for Tier I.

XV. Overall Assessment

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Semivolatiles - Data Qualification Summary - SDG E1D020174

SDG	Sample	Compound	Flag	A or P	Reason
E1D020174	BUILD_20_M_23_032101_1 BUILD_20_L_23_032101_2 BUILD_20_M_23_032201_7	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG E1D020174

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 21, 2001
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Polychlorinated Biphenyls
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D020174

Sample Identification

BUILD_20_M_23_032101_1
BUILD_20_L_23_032101_2
BUILD_20_M_23_032201_7
BUILD_20_M_23_032101_1MS
BUILD_20_M_23_032101_1MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D020174	All TCL compounds	Cooler temperature was reported at 18°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG E1D020174

SDG	Sample	Compound	Flag	A or P	Reason
E1D020174	BUILD_20_M_23_032101_1 BUILD_20_L_23_032101_2 BUILD_20_M_23_032201_7	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG E1D020174

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 21, 2001
LDC Report Date:	August 1, 2001
Matrix:	Soil
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D020174

Sample Identification

BUILD_20_M_23_032101_1
BUILD_20_L_23_032101_2
BUILD_20_M_23_032201_7

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8310 for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D020174	All TCL compounds	Cooler temperature was reported at 18°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for all samples. Since these samples were diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent

recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
EAEXJ1AS-LCS	Benzo(k)fluoranthene	37 (50-150)	All samples in SDG E1D020174	J (all detects) UJ (all non-detects)	P

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG E1D020174

SDG	Sample	Compound	Flag	A or P	Reason
E1D020174	BUILD_20_M_23_032101_1 BUILD_20_L_23_032101_2 BUILD_20_M_23_032201_7	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature
E1D020174	BUILD_20_M_23_032101_1 BUILD_20_L_23_032101_2 BUILD_20_M_23_032201_7	Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

Boeing Redevelopment Corp., C-6 Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E1D020174

No Sample Data Qualified in this SDG

LDC Report# 6779D28

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 21, 2001
LDC Report Date:	August 1, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D020174

Sample Identification

BUILD_20_M_23_032201_7

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196A for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No hexavalent chromium contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG E1D020174	Hexavalent chromium	No MS/MSD associated with these samples.	MS/MSD required.	None	P

b. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG E1D020174

SDG	Sample	Analyte	Flag	A or P	Reason
E1D020174	BUILD_20_M_23_032201_7	Hexavalent chromium	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG E1D020174

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	April 16, 2001
LDC Report Date:	August 10, 2001
Matrix:	Soil
Parameters:	Volatiles
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D160201

Sample Identification

Source_SP_5_041601_1
Source_SP_5_041601_2
Source_SP_5_041601_3
Source_SP_5_041601_4
Source_SP_5_041601_5
Source_SP_5_041601_6
BUILD_2_0_14_041601_01
Source_SP_5_041601_1MS
Source_SP_5_041601_1MSD
Source_SP_5_041601_5MS
Source_SP_5_041601_5MSD

Introduction

This data review covers 11 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D160201	All TCL compounds	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/MS Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

Internal standard areas and retention times were not reviewed for Tier I.

XI. Target Compound Identifications

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds (TICs) were not reviewed for Tier I.

XIV. System Performance

System performance data were not reviewed for Tier I.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Volatiles - Data Qualification Summary - SDG E1D160201

SDG	Sample	Compound	Flag	A or P	Reason
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6 BUILD_2_0_14_041601_01	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG E1D160201

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	April 16, 2001
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Polychlorinated Biphenyls
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D160201

Sample Identification

Source_SP_5_041601_1
Source_SP_5_041601_2
Source_SP_5_041601_3
Source_SP_5_041601_4
Source_SP_5_041601_5
Source_SP_5_041601_6
Source_SP_5_041601_2MS
Source_SP_5_041601_2MSD

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D160201	All TCL compounds	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample Source_SP_5_041601_5. Since the sample was diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent

recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG E1D160201

SDG	Sample	Compound	Flag	A or P	Reason
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6	All TCL compounds	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG E1D160201

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	April 16, 2001
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D160201

Sample Identification

Source_SP_5_041601_1
Source_SP_5_041601_2
Source_SP_5_041601_3
Source_SP_5_041601_4
Source_SP_5_041601_5
Source_SP_5_041601_6
BUILD_2_0_14_041601_01
Source_SP_5_041601_1MS
Source_SP_5_041601_1MSD

Introduction

This data review covers 9 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the preparation blanks (PBs) was based on the maximum contaminant concentration in the PBs in the analysis of each analyte. No contaminant concentrations were found in the preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.16 mg/Kg	All samples in SDG E1D160201

Sample concentrations were compared to the maximum contaminant concentrations detected in the PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check data was not provided and therefore not reviewed.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
Source_SP_5_041601_1MS/MSD (All samples in SDG E1D160201)	Antimony	26 (80-120)	24 (80-120)	-	J (all detects) R (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
Source_SP_5_041601_1MS/MSD (All samples in SDG E1D160201)	Chromium	123 (80-120)	124 (80-120)	-	J (all detects)	A
	Copper	131 (80-120)	-	-	J (all detects)	
	Zinc	124 (80-120)	-	-	J (all detects)	

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG E1D160201

SDG	Sample	Analyte	Flag	A or P	Reason
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6 BUILD_2_0_14_041601_01	Antimony	J (all detects) R (all non-detects)	A	Matrix spike/ Matrix spike duplicates (%R)
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6 BUILD_2_0_14_041601_01	Chromium Copper Zinc	J (all detects) J (all detects) J (all detects)	A	Matrix spike/ Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG E1D160201

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	April 16, 2001
LDC Report Date:	July 30, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D160201

Sample Identification

Source_SP_5_041601_1
Source_SP_5_041601_2
Source_SP_5_041601_3
Source_SP_5_041601_4
Source_SP_5_041601_5
Source_SP_5_041601_6
BUILD_2_0_14_041601_01
BUILD_2_0_14_041601_01MS
BUILD_2_0_14_041601_01MSD

Introduction

This data review covers 9 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D160201	Total volatile petroleum hydrocarbons	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total volatile petroleum hydrocarbon contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG E1D160201

SDG	Sample	Compound	Flag	A or P	Reason
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6 BUILD_2_0_14_041601_01	Total volatile petroleum hydrocarbons	J (all detects) UJ (all non-detects)	A	Cooler temperature

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E1D160201

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	April 16, 2001
LDC Report Date:	August 1, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1D160201

Sample Identification

Source_SP_5_041601_1
Source_SP_5_041601_2
Source_SP_5_041601_3
Source_SP_5_041601_4
Source_SP_5_041601_5
Source_SP_5_041601_6
BUILD_2_0_14_041601_01
Source_SP_5_041601_1MS
Source_SP_5_041601_1MSD

Introduction

This data review covers 9 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1D160201	TPH as extractables	Cooler temperature was reported at 16°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C.	J (all detects) UJ (all non-detects)	A

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
Source_SP_5_041601_1MS/MSD (Source_SP_5_041601_1)	TPH as extractables	-	57 (60-130)	-	J (all detects) UJ (all non-detects)	A

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E1D160201

SDG	Sample	Compound	Flag	A or P	Reason
E1D160201	Source_SP_5_041601_1 Source_SP_5_041601_2 Source_SP_5_041601_3 Source_SP_5_041601_4 Source_SP_5_041601_5 Source_SP_5_041601_6 BUILD_2_0_14_041601_01	TPH as extractables	J (all detects) UJ (all non-detects)	A	Cooler temperature
E1D160201	Source_SP_5_041601_1	TPH as extractables	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E1D160201

No Sample Data Qualified in this SDG

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Haley & Aldrich, Inc.
9040 Friars Road, Suite 202
San Diego, CA 92108
ATTN: Mr. Michael McDowell

December 7, 2001

SUBJECT: Boeing C-6 Site, Data Validation

Dear Mr. McDowell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on October 8, 2001. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 7224:

SDG #	Fraction
E1G130358, E1H240323, E1I270349	Volatiles (8260B), Volatiles (TO-14A), Semivolatiles, Arsenic, TPH as Gasoline, TPH as Extractables, Polynuclear Aromatic Hydrocarbons, Fixed Gases

The data validation was performed under Tier 1 and Tier 2 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996

Please feel free to contact us if you have any questions.

Sincerely,

Richard M. Amano
President/Principal Chemist

7224COV.HA

LDC #7224 (Haley & Aldrich/Boeing C-6 Site)

LDC	SDG#	DATE REC'D	DATE DUE	VOA (TO-14A)		VOA (8260B)		SVOA (8270C)		As (6010B)		TPH-C6-C8 (8015B)		TPH-CC (8015B)		PAHs (8310)		Fixed Gases (D1946)																			
Matrix: Water/Soil				A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	E1G130358	10-8-01	10-22-01	-	-	0	5	0	1	-	-	0	5	0	5	0	1	-	-																		
A	E1G130358	10-8-01	10-22-01	-	-	0	5	0	5	-	-	0	5	0	5	0	5	-	-																		
B	E1H240323	10-8-01	10-22-01	-	-	-	-	-	-	0	13	-	-	-	-	-	-	-	-																		
B	E1H240323	10-8-01	10-22-01	-	-	-	-	-	-	0	12	-	-	-	-	-	-	-	-																		
C	E1I270349	10-8-01	10-22-01	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0																		
C	E1I270349	10-8-01	10-22-01	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0																		
Total	B			4	0	0	10	0	6	0	25	0	10	0	10	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Shad[illegible] cells indicate Tier 2 validation (all other cells are Tier 1 validation). These sample counts [illegible]t include MS/MSD, and DUPs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	July 13, 2001
LDC Report Date:	October 12, 2001
Matrix:	Soil
Parameters:	Semivolatiles
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Services
Sample Delivery Group (SDG):	E1G130358

Sample Identification

BUILD-2-T20-071301-B24*
BUILD-2-T20-071301-E19
BUILD-2-T20-071301-B21*
BUILD-2-T20-071301-W17*
BUILD-2-T20-071301-N19*
BUILD-2-T20-071301-B20*
BUILD-2-T20-071301-B24MS
BUILD-2-T20-071301-B24MSD

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

BOE-C6-0001899

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
7/2/01	2,4-Dinitrophenol 4,6-Dinitro-2-methylphenol	33.167 31.863	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* 1194519BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
6/25/01	Benzoic acid	30.113	BUILD-2-T20-071301-B21* BUILD-2-T20-071301-B20*	J (all detects) UJ (all non-detects)	A

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
7/16/01 (ES569)	Benzoic acid	27.1	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* 1194519BLK	J (all detects) UJ (all non-detects)	A
7/16/01 (IS495)	Benzoic acid	32.3	BUILD-2-T20-071301-B21* BUILD-2-T20-071301-B20*	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. Since the samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since the sample concentration was greater than the spiked concentration, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Semivolatiles - Data Qualification Summary - SDG E1G130358

SDG	Sample	Compound	Flag	A or P	Reason
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19*	2,4-Dinitrophenol 4,6-Dinitro-2-methylphenol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
E1G130358	BUILD-2-T20-071301-B21* BUILD-2-T20-071301-B20*	Benzoic acid	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	Benzoic acid	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)

Boeing Redevelopment Corp., C-6 Site
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG E1G130358

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	July 13, 2001
LDC Report Date:	October 12, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Gasoline
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1G130358

Sample Identification

BUILD-2-T20-071301-B24*
BUILD-2-T20-071301-E19
BUILD-2-T20-071301-B21*
BUILD-2-T20-071301-W17*
BUILD-2-T20-071301-N19*
BUILD-2-T20-071301-B16
BUILD-2-T20-071301-B20*
BUILD-2-T20-071301-W15
BUILD-2-T20-071301-S13
BUILD-2-T20-071301-E12
BUILD-2-T20-071301-W15MS
BUILD-2-T20-071301-W15MSD

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 12 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0%QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
EGE7F1AD	7/17/01	TPH as gasoline (C6-C8)	0.11 mg/Kg	BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B16 BUILD-2-T20-071301-B20* BUILD-2-T20-071301-S13 BUILD-2-T20-071301-E12

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
BUILD-2-T20-071301-B20*	TPH as gasoline (C6-C8)	0.29 mg/Kg	1.0U mg/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG E1G130358

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG E1G130358

SDG	Sample	Compound	Modified Final Concentration	A or P
E1G130358	BUILD-2-T20-071301-B20*	TPH as gasoline (C6-C8)	1.0U mg/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	July 13, 2001
LDC Report Date:	October 12, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Laboratories
Sample Delivery Group (SDG):	E1G130358

Sample Identification

BUILD-2-T20-071301-B24*
BUILD-2-T20-071301-E19
BUILD-2-T20-071301-B21*
BUILD-2-T20-071301-W17*
BUILD-2-T20-071301-N19*
BUILD-2-T20-071301-B16
BUILD-2-T20-071301-B20*
BUILD-2-T20-071301-W15
BUILD-2-T20-071301-S13
BUILD-2-T20-071301-E12
BUILD-2-T20-071301-E12MS
BUILD-2-T20-071301-E12MSD

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 12 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples BUILD-2-T20-071301-E19 and BUILD-2-T20-071301-W17*. Since the samples were diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG E1G130358

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG E1G130358

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	July 13, 2001
LDC Report Date:	October 12, 2001
Matrix:	Soil
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	Tier 1 & 2
Laboratory:	Del Mar Analytical
Sample Delivery Group (SDG):	E1G130358

Sample Identification

BUILD-2-T20-071301-B24*
BUILD-2-T20-071301-E19
BUILD-2-T20-071301-B21*
BUILD-2-T20-071301-W17*
BUILD-2-T20-071301-N19*
BUILD-2-T20-071301-B20*

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 6 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8310 for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20% for all compounds.

b. Calibration Verification

Calibration verification was performed at required frequencies.

The percent recoveries (%R) of amounts in continuing standard mixtures were within the 85-115% QC limits with the following exceptions:

Date	Standard ID	Column	Compound	%R	Associated Samples	Flag	A or P
7/17/01	G17A003	Channel A	Benzo(k)fluoranthene	189	All samples in SDG E1G130358	J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
C1G1612-BLK	7/16/01	Acenaphthylene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene	15.5 ug/Kg 0.391 ug/Kg 2.29 ug/Kg 10.2 ug/Kg	All samples in SDG E1G130358

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks

with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
BUILD-2-T20-071301-B24*	Acenaphthylene Naphthalene	2300 ug/Kg 5700 ug/Kg	25000U ug/Kg 10000U ug/Kg
BUILD-2-T20-071301-E19	Fluorene	88 ug/Kg	500U ug/Kg
BUILD-2-T20-071301-B21*	Fluorene Naphthalene	1700 ug/Kg 7000 ug/Kg	5000U ug/Kg 20000U ug/Kg
BUILD-2-T20-071301-W17*	Fluorene	210 ug/Kg	1000U ug/Kg
BUILD-2-T20-071301-N19*	Acenaphthylene	21 ug/Kg	50U ug/Kg
BUILD-2-T20-071301-B20*	Acenaphthylene Naphthalene	5100 ug/Kg 3400 ug/Kg	10000U ug/Kg 4000U ug/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. Since the samples were diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG E1G130358	All TCL compounds	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG E1G130358

SDG	Sample	Compound	Flag	A or P	Reason
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-E19 BUILD-2-T20-071301-B21* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	A	Calibration verification (%R)
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-E19 BUILD-2-T20-071301-B21* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	All TCL compounds	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG E1G130358

SDG	Sample	Compound	Modified Final Concentration	A or P
E1G130358	BUILD-2-T20-071301-B24*	Acenaphthylene Naphthalene	25000U ug/ Kg 10000U ug/ Kg	A
E1G130358	BUILD-2-T20-071301-E19	Fluorene	500U ug/ Kg	A
E1G130358	BUILD-2-T20-071301-B21*	Fluorene Naphthalene	5000U ug/ Kg 20000U ug/ Kg	A
E1G130358	BUILD-2-T20-071301-W17*	Fluorene	1000U ug/ Kg	A
E1G130358	BUILD-2-T20-071301-N19*	Acenaphthylene	50U ug/ Kg	A
E1G130358	BUILD-2-T20-071301-B20*	Acenaphthylene Naphthalene	10000U ug/ Kg 4000U ug/ Kg	A

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: August 24, 2001

LDC Report Date: October 23, 2001

Matrix: Soil

Parameters: Arsenic

Validation Level: Tier 1 & 2

Laboratory: Severn Trent Services

Sample Delivery Group (SDG): E1H240323

Sample Identification

PD-142-1*	PD-151-3*
PD-142-3	PD-152-1
PD-143-1*	PD-152-3*
PD-143-3	PD-153-1
PD-144-1*	PD-153-3
PD-144-3	PD-142-1MS
PD-145-1*	PD-142-1MSD
PD-145-3	PD-151-3MS
PD-146-1*	PD-151-3MSD
PD-146-2	
PD-146-3*	
PD-147-1	
PD-147-3*	
PD-148-1	
PD-148-3*	
PD-149-1	
PD-149-3*	
PD-150-1	
PD-150-3*	
PD-151-1	

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 29 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Arsenic.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/ CCB/ PBs) was based on the maximum contaminant concentration in the ICB/ CCB/ PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Arsenic - Data Qualification Summary - SDG E1H240323

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Arsenic - Laboratory Blank Data Qualification Summary - SDG E1H240323

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	September 27, 2001
LDC Report Date:	October 12, 2001
Matrix:	Air
Parameters:	Volatiles (TO-14)
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Services
Sample Delivery Group (SDG):	E1I270349

Sample Identification

VEW-4A-DILUTED INLET*
VEW-4B-DILUTED INLET
VEW-5A-DILUTED INLET*
VEW-5B-DILUTED INLET

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 4 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method TO-14 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999); the following subsections correlate to the above guidelines.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
8/24/01	Vinyl acetate Benzyl chloride	33.710 33.518	VEW-4A-DILUTED INLET* VEW-5A-DILUTED INLET* 1272174BLK	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
9/28/01	Dichlorodifluoromethane 1,2-Dichloro-1,1,2,2-tetrafluoroethane Trichlorofluoromethane	46.0 36.1 43.8	VEW-4A-DILUTED INLET* VEW-5A-DILUTED INLET* 1272174BLK	J (all detects) UJ (all non-detects)	P

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blank analyses were performed at the required frequency. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were not required by the method.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VIII. Laboratory Control Samples (LCS)

Although laboratory control samples were not required by the method, laboratory control samples were reported by the laboratory. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Volatiles (TO-14) - Data Qualification Summary - SDG E1I270349

SDG	Sample	Compound	Flag	A or P	Reason
E1I270349	VEW-4A-DILUTED INLET* VEW-5A-DILUTED INLET*	Vinyl acetate Benzyl chloride	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Initial calibration (%RSD)
E1I270349	VEW-4A-DILUTED INLET* VEW-5A-DILUTED INLET*	Dichlorodifluoromethane 1,2-Dichloro-1,1,2,2-tetrafluoroethane Trichlorofluoromethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)

Boeing Redevelopment Corp., C-6 Site
Volatiles (TO-14) - Laboratory Blank Data Qualification Summary - SDG E1I270349

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	September 27, 2001
LDC Report Date:	October 12, 2001
Matrix:	Air
Parameters:	Fixed Gases
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Services
Sample Delivery Group (SDG):	E1I270349

Sample Identification

VEW-4A-DILUTED INLET*
VEW-4B-DILUTED INLET
VEW-5A-DILUTED INLET*
VEW-5B-DILUTED INLET

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 4 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Standard Method D1946 for Fixed Gases.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 25.0%.

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 25.0% QC limits.

III. Blanks

Method blanks were performed at the required frequency. No fixed gases contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

c. Laboratory Control Samples

Laboratory control samples were analyzed at the required frequency. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Fixed Gases - Data Qualification Summary - SDG E1I270349

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Fixed Gases - Laboratory Blank Data Qualification Summary - SDG E1I270349

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	July 13, 2001
LDC Report Date:	October 12, 2001
Matrix:	Soil
Parameters:	Volatiles
Validation Level:	Tier 1 & 2
Laboratory:	Severn Trent Services
Sample Delivery Group (SDG):	E1G130358

Sample Identification

BUILD-2-T20-071301-B24*
BUILD-2-T20-071301-E19
BUILD-2-T20-071301-B21*
BUILD-2-T20-071301-W17*
BUILD-2-T20-071301-N19*
BUILD-2-T20-071301-B16
BUILD-2-T20-071301-B20*
BUILD-2-T20-071301-W15
BUILD-2-T20-071301-S13
BUILD-2-T20-071301-E12
BUILD-2-T20-071301-B21MS
BUILD-2-T20-071301-B21MSD
BUILD-2-T20-071301-W15MS
BUILD-2-T20-071301-W15MSD

*Indicates sample underwent Tier 2 review

Introduction

This data review covers 14 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
7/3/01	Chloroethane	35.455	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19*	J (all detects) UJ (all non-detects)	A
	2-Chloroethylvinyl ether	40.311	BUILD-2-T20-071301-B20* 1197356BLK	J (all detects) UJ (all non-detects)	

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
7/3/01	t-Butanol Acrolein	0.03788 (≥0.05) 0.01425 (≥0.05)	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20* 1197356BLK	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A
5/9/01	t-Butanol Acrolein	0.04530 (≥0.05) 0.02038 (≥0.05)	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21* 119471BLK	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
7/13/01	Dichlorodifluoromethane Bromomethane Chloroethane Acetone t-Butanol Vinyl acetate Iodomethane tert-Butylbenzene 2-Butanone 4-Methyl-2-pentanone 2-Hexanone	34.3 55.6 38.2 32.2 25.6 27.5 50.5 27.0 48.3 34.1 32.5	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20* 1197356BLK	J (all detects) UJ (all non-detects)	A
7/16/01	Dichlorodifluoromethane Acrolein Acrylonitrile 1,2-Dichloroethane Bromodichloromethane Tetrachloroethene	33.1 62.0 29.3 29.5 29.0 26.0	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21* 1197471BLK	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
7/13/01	Bromomethane Acrolein t-Butanol	0.04234 (≥0.05) 0.01248 (≥0.05) 0.04759 (≥0.05)	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20* 1197356BLK	J (all detects) R (all non-detects)	A
7/16/01	Acrolein t-Butanol Acrylonitrile	0.00774 (≥0.05) 0.04913 (≥0.05) 0.03893 (≥0.05)	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21* 1197471BLK	J (all detects) R (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since the sample concentration was greater than the spiked concentration, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Volatiles - Data Qualification Summary - SDG E1G130358

SDG	Sample	Compound	Flag	A or P	Reason
E1G130358	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	Chloroethane 2-Chloroethylvinyl ether	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21* BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	t-Butanol Acrolein	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A	Initial calibration (RRF)
E1G130358	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	Dichlorodifluoromethane Bromomethane Chloroethane Acetone t-Butanol Vinyl acetate Iodomethane tert-Butylbenzene 2-Butanone 4-Methyl-2-pentanone 2-Hexanone	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21*	Dichlorodifluoromethane Acrolein Acrylonitrile 1,2-Dichloroethane Bromodichloromethane Tetrachloroethene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
E1G130358	BUILD-2-T20-071301-W17* BUILD-2-T20-071301-N19* BUILD-2-T20-071301-B20*	Bromomethane Acrolein t-Butanol	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)
E1G130358	BUILD-2-T20-071301-B24* BUILD-2-T20-071301-B21*	Acrolein t-Butanol Acrylonitrile	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)

Boeing Redevelopment Corp., C-6 Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG E1G130358

No Sample Data Qualified in this SDG

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Haley & Aldrich, Inc.
9040 Friars Road, Suite 202
San Diego, CA 92108
ATTN: Mr. Michael McDowell

December 19, 2001

SUBJECT: Boeing C-6 Site, Data Validation

Dear Mr. McDowell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 4, 2001. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 6395:

SDG #	Fraction
KJC10770, KJC10776, KJC10779, KJC10298, KJC10299, KJC10301, KJC10304, KJC10307, KJC11587, KJC11589, KJC11594, KJC11598	Volatiles, Semivolatiles, Chlorinated Pesticides, Metals, Total Volatile Fuel Hydrocarbons, TPH as Extractables, Hexavalent Chromium

The data validation was performed under Tier 1 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996

A significant portion of the data was not provided and a complete validation could not be performed. The individual reports detail the missing data. Please feel free to contact us if you have any questions.

Sincerely,

Richard M. Amano
President/Principal Chemist

6395COV2.HA

Attachment 1

LDC #6395 (Haley & Aldrich/Boeing C-6 Site)

LDC	SDG#	DATE REC'D	DATE DUE	VOA (8260B)		SVOA (8270)		Pest. (8080)		Metals (SW846)		Diss. Metals (SW846)		TVPH (8015)		TPH-E (8015)		Methane Ethane Ethene		ALK (2320)		Cl, SO_4 (300.0)		NO_2-N NO_3-N (300.0)		Ferrous Iron (3500)		TOC (415.1)		CRVI (7196A)							
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	E1A190286	5-4-01	5-18-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 3					
B	E1A290172	5-4-01	5-18-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 2					
C	KJC10770	5-4-01	5-18-01	3	0	2	0	2	0	2	0	-	-	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	Tier 1					
D	KJC10776	5-4-01	5-18-01	9	0	8	0	8	0	8	0	-	-	8	0	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	Tier 1					
E	KJC10779	5-4-01	5-18-01	7	0	6	0	6	0	6	0	-	-	6	0	6	0	-	-	-	-	-	-	-	-	-	-	-	-	6	0	Tier 1					
F	KJC10298	5-4-01	5-18-01	9	0	8	0	8	0	8	0	-	-	8	0	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	Tier 1					
G	KJC10299	5-4-01	5-18-01	10	0	8	0	8	0	8	0	-	-	8	0	8	0	-	-	-	-	-	-	-	-	-	-	-	-	8	0	Tier 1					
H	KJC10301	5-4-01	5-18-01	18	0	16	0	16	0	16	0	-	-	16	0	16	0	-	-	-	-	-	-	-	-	-	-	-	-	16	0	Tier 1					
I	KJC10304	5-4-01	5-18-01	15	0	13	0	13	0	13	0	-	-	13	0	13	0	-	-	-	-	-	-	-	-	-	-	-	-	13	0	Tier 1					
J	KJC10307	5-4-01	5-18-01	0	3	0	3	0	3	0	3	-	-	0	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	0	3	Tier 1					
K	KJC11587	5-4-01	5-18-01	7	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 1					
L	KJC11589	5-4-01	5-18-01	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 1					
M	KJC11594	5-4-01	5-18-01	13	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 1					
N	KJC11598	5-4-01	5-18-01	11	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Tier 1					
Total	B			110	3	61	3	61	3	61	3	0	0	61	3	61	3	0	0	0	0	0	0	0	0	0	0	0	0	61	3	0	0	0	0	0	0

Th ample counts do not include MS/MSD, and DUPs

639(HA

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	All TCL compounds	No MS/MSD associated with these samples.	MS/MSD required.	None	P

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	All TCL compounds	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: June 30, 1998

LDC Report Date: May 11, 2001

Matrix: Soil

Parameters: Chlorinated Pesticides

Validation Level: Tier 1

Laboratory: Orange Coast Analytical, Inc.

Sample Delivery Group (SDG): KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-01-S63098MS
TMW-04-01-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-10-S062898MS
TMW-2-10-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike analysis data were not provided and therefore not reviewed.

VI. Duplicate Sample Analysis

Duplicate sample analysis data were not provided and therefore not reviewed.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-65-6S3098MS
TMW-04-65-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	Total volatile petroleum hydrocarbons	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	Total volatile petroleum hydrocarbons	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998
TMW-07-01-S62998MS
TMW-07-01-S62998MSD
TMW-07-10-S62998MS
TMW-07-10-S62998MSD

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-5-S062898MS
TMW-2-5-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	TPH as extractables	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	TPH as extractables	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

LDC Report# 6395I8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-05-S63098MS
TMW-04-05-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998
TMW-07-01-S62998MS
TMW-07-01-S62998MSD
TMW-07-10-S62998MS
TMW-07-10-S62998MSD

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-1-S062898MS
TMW-2-1-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 4, 1999
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10776

Sample Identification

WCC5S-GW-1-70
WCC7S-GW-1-70
WCC4S-GW-1-70
WCC11S-GW-1-70
TMW9-GW-1-70
TMW6-GW-1-70
TMW5-GW-1-70
TMW4-GW-1-70
WCC5S-GW-1-70MS
WCC5S-GW-1-70MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10776

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10776

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1999
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

LDC Report# 6395J28

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	December 18, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	All TCL compounds	No MS/MSD associated with these samples.	MS/MSD required.	None	P

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	All TCL compounds	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-01-S63098MS
TMW-04-01-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Chlorinated Pesticides
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-10-S062898MS
TMW-2-10-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8080 for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not reviewed for Tier I.

III. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

V. Blanks

Method blanks data were not provided and therefore not reviewed.

VI. Surrogate Spikes

Surrogate spike analysis data were not provided and therefore not reviewed.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

XII. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike analysis data were not provided and therefore not reviewed.

VI. Duplicate Sample Analysis

Duplicate sample analysis data were not provided and therefore not reviewed.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Metals
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

Calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check sample data were not reviewed for Tier I.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control sample analysis data were not provided and therefore not reviewed.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Metals - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Metals - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: June 30, 1998

LDC Report Date: May 11, 2001

Matrix: Soil

Parameters: Total Volatile Petroleum Hydrocarbons

Validation Level: Tier 1

Laboratory: Orange Coast Analytical, Inc.

Sample Delivery Group (SDG): KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-65-6S3098MS
TMW-04-65-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/ contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	Total volatile petroleum hydrocarbons	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	Total volatile petroleum hydrocarbons	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998
TMW-07-01-S62998MS
TMW-07-01-S62998MSD
TMW-07-10-S62998MS
TMW-07-10-S62998MSD

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Volatile Petroleum Hydrocarbons
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-5-S062898MS
TMW-2-5-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Volatile Petroleum Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Volatile Petroleum Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG KJC10307	TPH as extractables	No MS/MSD associated with these samples.	MS/MSD required.	None	P

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10307

SDG	Sample	Compound	Flag	A or P	Reason
KJC10307	TMW-9-40 TMW-9-50 TMW-9-65	TPH as extractables	None	P	Matrix spike/ Matrix spike duplicates

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098
TMW-04-05-S63098MS
TMW-04-05-S63098MSD

Introduction

This data review covers 15 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998
TMW-07-01-S62998MS
TMW-07-01-S62998MSD
TMW-07-10-S62998MS
TMW-07-10-S62998MSD

Introduction

This data review covers 20 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 11, 2001
Matrix:	Soil
Parameters:	Total Petroleum Hydrocarbons as Extractables
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898
TMW-2-1-S062898MS
TMW-2-1-S062898MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogate spike analysis data were not provided and therefore not reviewed.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Target Compound Identification

Target compound identification (RT) data were not reviewed for Tier I.

VI. Compound Quantitation and CRQLs

Compound quantitation and CRQLs were not reviewed for Tier I.

VII. System Performance

System performance data were not reviewed for Tier I.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	March 4, 1999
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10776

Sample Identification

WCC5S-GW-1-70
WCC7S-GW-1-70
WCC4S-GW-1-70
WCC11S-GW-1-70
TMW9-GW-1-70
TMW6-GW-1-70
TMW5-GW-1-70
TMW4-GW-1-70
WCC5S-GW-1-70MS
WCC5S-GW-1-70MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10776

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10776

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1999
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10298

Sample Identification

TMW-2-1-S062898
TMW-2-5-S062898
TMW-2-10-S062898
TMW-2-20-S062898
TMW-2-30-S062898
TMW-2-40-S062898
TMW-2-50-S062898
TMW-2-66-S062898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10298

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 28, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10299

Sample Identification

TMW-01-03-S62898
TMW-01-05-S62898
TMW-01-10-S62898
TMW-01-20-S62898
TMW-01-30-S62898
TMW-01-40-S62898
TMW-01-50-S62898
TMW-01-66-S62898

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10299

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 29, 1998
LDC Report Date:	May 15, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10301

Sample Identification

TMW-08-01-S62998
TMW-08-05-S62998
TMW-08-10-S62998
TMW-08-20-S62998
TMW-08-30-S62998
TMW-08-40-S62998
TMW-08-50-S62998
TMW-08-65-S62998
TMW-07-01-S62998
TMW-07-05-S62998
TMW-07-10-S62998
TMW-07-20-S62998
TMW-07-30-S62998
TMW-07-40-S62998
TMW-07-50-S62998
TMW-07-65-S62998

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10301

No Sample Data Qualified in this SDG

LDC Report# 6395J28

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Boeing Redevelopment Corp., C-6 Site
Collection Date:	June 30, 1998
LDC Report Date:	December 18, 2001
Matrix:	Soil
Parameters:	Hexavalent Chromium
Validation Level:	Tier 1
Laboratory:	Orange Coast Analytical, Inc.
Sample Delivery Group (SDG):	KJC10307

Sample Identification

TMW-9-40
TMW-9-50
TMW-9-65

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10307

No Sample Data Qualified in this SDG

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Boeing Redevelopment Corp., C-6 Site

Collection Date: June 30, 1998

LDC Report Date: May 15, 2001

Matrix: Soil

Parameters: Hexavalent Chromium

Validation Level: Tier 1

Laboratory: Orange Coast Analytical, Inc.

Sample Delivery Group (SDG): KJC10304

Sample Identification

TMW-04-01-S63098
TMW-04-05-S63098
TMW-04-10-S63098
TMW-04-20-S63098
TMW-04-30-S63098
TMW-04-40-S63098
TMW-04-50-S63098
TMW-04-65-S63098
TMW-9-1-S63098
TMW-9-5-S63098
TMW-9-10-S63098
TMW-9-20-S63098
TMW-9-30-S63098

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 7196 for Hexavalent Chromium.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

Technical holding time requirements were not provided and therefore not reviewed.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration data were not reviewed for Tier I.

IV. Continuing Calibration

Continuing calibration data were not reviewed for Tier I.

III. Blanks

Method blanks data were not provided and therefore not reviewed.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control sample analysis data were not provided and therefore not reviewed.

V. Sample Result Verification

Sample result verification data were not reviewed for Tier 1.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

Boeing Redevelopment Corp., C-6 Site
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG KJC10304

No Sample Data Qualified in this SDG

APPENDIX G

Deep Soil Boring Logs

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2	Boring Name: C-2-12
DRILLING COMPANY: Water D	DRILLER: Bryant
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 8
	Project Name: Boeing C-6, Parcel C
	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 50
LOGGED BY: TD	DATE STARTED: 5-24-01 / DATE COMPLETED: 5-24-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No sampling top 20 feet. See log C-2-12 completed 5-11-01.
					5				
					10				
					15				
					20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
					25				
					30				less clay
					35				
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, medium dense

K:\Boeing\C-6 Boring Logs\C-2-12a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-12
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, medium dense, "shell bed"
					45				
					50				Total Depth = 50'
					55				
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-12aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2	Boring Name: C-2-12-1
DRILLING COMPANY: Water D; DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 50
LOGGED BY: M. Balderman	DATE STARTED: 5-24-01 ; DATE COMPLETED: 5-24-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No sampling top 20 feet.
					5				
					10				
					15				
					20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
					25				
					30				less clay
					35				
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, medium dense, very fine sand

K:\Boeing\C-6 Boring Logs\C-2-12-1a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-12-1
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine sand
					45				
					50				Total Depth = 50'
					55				
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-12-1aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2		Boring Name: C-2-12-2	
DRILLING COMPANY: West Hazmat	DRILLER: Doug	Project Name: Boeing C-6, Parcel C	
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01	
DEPTH TO WATER (ft.): Not Encountered		ELEVATION (ft. MSL): .	TOTAL DEPTH (ft.): 50
LOGGED BY: M. Balderman		DATE STARTED: 5-24-01	DATE COMPLETED: 5-24-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No sampling top 20 feet.
					5				
					10				
					15				
					20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
					25				
					30				less clay
					35				
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine sand

K:\Boeing\C-6 Boring Logs\C-2-12-2b.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-12-2
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine sand
					45				
					50				Total Depth = 50'
					55				
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-12-2bb.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 2	Boring Name: C-2-12-3
DRILLING COMPANY: West Hazmat / DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 50
LOGGED BY: M. Balderman	DATE STARTED: 5-24-01 / DATE COMPLETED: 5-24-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No sampling top 20 feet.
					5				
					10				
					15				
					20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
					25				
					30			2.5Y 5/6	Clayey SILT: light olive brown, damp, dense, less clay
					35				
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, very fine, damp, slightly dense, loose

K:\Boeing\C-6 Boring Logs\C-2-12-3c.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-12-3
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine sand
					45				
					50				Total Depth = 50'
					55				
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-12-3cc.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: 53	Boring Name: C-2-26
DRILLING COMPANY: West Hazmat; DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 61
LOGGED BY: M. Balderman	DATE STARTED: 5-4-01 ; DATE COMPLETED: 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
							SM	10YR 6/6	Silty SAND: brownish yellow, fine to coarse sand, damp, loose
					5		ML	10YR 4/2	Sandy SILT with Clay: dark grayish brown, damp, medium stiff
					10			10YR 6/6	Sandy SILT with Clay: brownish yellow, damp, ~30 % sand, medium stiff, massive
					15				
					20		SM	10YR 5/4	Silty SAND: yellowish brown, damp, dense, 65 % sand, fine
					25		ML	10YR 5/4	Sandy SILT with minor Clay: yellowish brown, 35 % sand, damp, stiff, fine sand
					30		SM	10YR 6/6	Silty SAND: brownish yellow, 80 % sand, minor fine mica, damp, dense, fine, brown mottled with gray
					35				
					40				minor coarse sand, trace fine gravel

K:\Boeing\C-6 Boring Logs\C-2-26a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name C-2-26
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 6/6	Silty SAND: brownish yellow, 80 % sand, minor coarse sand, trace fine gravel
					45				
					50		ML	10YR 5/4	Sandy SILT with CLay: yellowish brown, stiff, damp, fine
								5Y 6/1	Sandy SILT : gray, mottled, trace fine mica
					55				
							SM	10YR 6/2	Silty SAND: light olive gray, 90 % sand, minor mica, very dense, damp, fine
					60		ML	5Y 4/1	Sandy SILT: dark gray
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-26aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: 53	Boring Name: C-2-26-1
DRILLING COMPANY: West Hazmat / DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 60
LOGGED BY: Tim Doyle	DATE STARTED: 6-1-01 / DATE COMPLETED: 6-1-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				
		✓			10		ML	2.5Y 4/4	Clayey SILT: olive brown, damp, stiff
					15				
		✓			20			2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
		✓			25				
		✓			30		ML	2.5Y 5/6	Sandy SILT: light olive brown, damp, stiff
					35				
		✓			40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, dense

K:\Boeing\C-6 Boring Logs\C-2-26-1b.dwg, 7/26/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-26-1
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: continued
					45				
					50		ML	2.5Y 6/8	Clayey SILT: olive yellow, damp, stiff
								2.5Y 6/1	mottled gray & yellow
					55				
							SM	2.5Y 6/3	Silty SAND: light yellowish brown, damp, loose
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-26-1bb.dwg, 7/26/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: 53		Boring Name C-2-26-2
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60
LOGGED BY Tim Doyle		DATE STARTED 6-1-01 / DATE COMPLETED 6-1-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				
		✓			10		ML	10YR 5/4	Clayey SILT: yellowish brown, damp, stiff
					15				
		✓			20			10YR 5/6	Clayey SILT: yellowish brown, damp, stiff, trace amounts of possible calcium carbonate
		✓			25			2.5Y 5/6	Sandy SILT: light olive brown, damp, medium stiff
		✓			30		SM	2.5Y 6/6	Silty SAND: olive yellow, damp, loose, very fine to fine sand
					35				
		✓			40			2.5Y 6/4	Silty SAND: light yellowish brown, damp, loose, very fine to fine sand

K:\Boeing\C-6 Boring Logs\C-2-26-2c.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-26-2
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/4	Silty SAND: light yellowish brown, damp, loose, very fine to fine sand
					45				
					50			2.5Y 5/6	light olive brown, slightly denser
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-26-2cc.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: 58		Boring Name	C-2-33
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-22-01	DATE COMPLETED 5-22-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				Backfill material
					10				
					15				
		■			20		ML	2.5Y 4/4	Clayey SILT: olive brown, damp, stiff
		■			25				
		■			30			2.5Y 5/4	light olive brown
					35				
		■			40		SM	2.5Y 5/6	Silty SAND: light olive brown, damp, loose, very fine to fine sand

K:\Boeing\C-6 Boring Logs\C-2-33o.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-33
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 5/6	Silty SAND: light olive brown, damp, loose, very fine to fine sand
					45				
					50		ML	5Y 5/3	Sandy SILT: olive, damp, medium stiff, very fine sand
					55				
					60		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose
									Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-33aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: 51	Boring Name: C-2-72
DRILLING COMPANY: West Hazmat; DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 60.5
LOGGED BY: M. Balderman	DATE STARTED: 5-4-01 ; DATE COMPLETED: 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Clayey Silty SAND: brown, with gravel and concrete (fill)
					5				
					10		ML	10YR 5/4	Sandy SILT: yellowish brown, 40 % fine sand, trace fine mica, damp, medium dense, mottled with disseminated concretions
					15				
					20			10YR 5/4	Clayey SILT: yellowish brown, 20 % fine sand, damp, stiff, mottled with concretions
					25		SM	10YR 6/6 10YR 6/2	Silty SAND: brownish yellow to light brownish gray, 70 % fine sand, trace mica, damp, dense
					30				
					35				
					40		SM/SP	10YR 6/2	Silty SAND: light brownish gray, 90 % sand, trace fine mica, damp, very dense

K:\Boeing\C-6 Boring Logs\C-2-72a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name C-2-72
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM/SP	10YR 6/2	Silty SAND: light brownish gray, 90 % sand, trace fine mica, damp, very dense
					45				
					50		ML/SM	10YR 5/4 10YR 6/2	Sandy SILT/Silty SAND: yellowish brown, fine silty sand, 75 % sand, minor fine mica, in 1-2 inch intervals with fine sand, minor clay, minor mica, damp, very dense
					55				
					60		SM	10YR 5/4	Silty SAND: yellowish brown, 80 % sand, minor, fine to moderate mica, damp, very dense
									Total Depth = 60.5
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-72aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: F31		Boring Name C-2-143
DRILLING COMPANY West Hazmat	DRILLER Travis	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60
LOGGED BY TD		DATE STARTED 6-1-01 / DATE COMPLETED 6-1-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 20 feet.
					5				
					10				
					15				
		☒			20		ML	2.5Y 5/6	Clayey SILT: light olive brown, damp, stiff
		☒			25		CL	2.5Y 5/0	Silty CLAY: gray, damp, stiff
		☒			30		ML	2.5Y 5/4	Sandy SILT: light olive brown, damp, medium stiff
					35			2.5Y 6/0	Silty SAND: gray, very fine, damp
		☒			40		SM	2.5Y 6/6	Silty SAND: olive yellow, very fine sand, damp, slightly dense

K:\Boeing\C-6 Boring Logs\C-2-143a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-143
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/1	Silty SAND: olive yellow, very fine sand, damp, slightly dense
					45				
					50		ML	5Y 3/4	Sandy SILT: dark olive, damp, medium stiff
					55				
					60		SM	2.5Y 6/4	Silty SAND: light yellowish brown, damp, loose
									Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-143aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: Open Space		Boring Name	C-2-149
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60.5
LOGGED BY M. Balderman		DATE STARTED 5-4-01	DATE COMPLETED 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 20'
					5				
					10				
					15				
		☒			20		ML	10YR 4/2	Clayey SILT: dark grayish brown, 20 % fine sand, damp, stiff
		☒			25		SM	10YR 6/6 10YR 6/2	Silty SAND: brownish yellow, 70 % fine sand, minor fine mica, damp, dense, mottled light brownish gray
		☒			30				
					35				
		☒			40		SP/SM	10YR 6/2	Silty SAND-SAND: light brownish gray, 90 % fine sand, minor fine mica, damp, very dense,

K:\Boeing\C-6 Boring Logs\C-2-149a.dwg, 7/26/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-149
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SP/SM	10YR 6/2	Silty SAND-SAND: light brownish gray, 90 % fine sand, minor fine mica, damp, very dense
					45				
					50		ML	10YR 5/4	Sandy SILT with CLAY: yellowish brown, 25 % sand, damp/moist, stiff, fine shell fragments conc. in layers, (~2 @ ~50.2) minor mica
					55				
					60		SP	10YR 5/4	SAND: yellowish brown, fine to medium, minor silt, minor fine mica, very dense, damp
									Total Depth = 60.5'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-149aa.dwg, 7/26/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: F32		Boring Name C-2-160
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60.5
LOGGED BY M. Balderman		DATE STARTED 5-4-01 / DATE COMPLETED 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 10'
					5				
					10		ML	10YR 5/4	Clayey SILT: yellowish brown, 30 % fine sand, damp, stiff (bottom tube disturbed - used middle)
					15				
					20				minor concretions in local zones
					25		ML/SM	10YR 5/4	Sandy SILT/Silty SAND: ~50 % fine sand, trace fine mica, damp, dense, massive
					30		SM	10YR 6/6 10YR 6/2	Silty SAND: brownish yellow, 75 % fine sand, trace fine mica, damp, dense brown and gray mottled
					35				
					40		SM		

K:\Boeing\C-6 Boring Logs\C-2-160a.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-160
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	.	Silty SAND: continued
					45				
					50		SM	10YR 5/4	Silty SAND: yellowish brown, 80 % fine sand, minor fine mica, moist, very dense ~ 1/2" inter beds stiff gray clayey silt
					55				
					60		ML	10YR 5/4 10YR 6/2	Clayey SILT: yellowish brown - light brownish gray, 20 % fine sand, minor fine mica, moist, stiff - bottom of sample fine silty sand
									Total Depth = 60.5'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-160aa.dwg, 7/30/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: F18		Boring Name C-2-199
DRILLING COMPANY West Hazmat	DRILLER Travis	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60
LOGGED BY TD		DATE STARTED 5-25-01 / DATE COMPLETED 5-25-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 20 feet.
					5				
					10				
					15				
		☒			20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
		☒			25				
		☒			30		SM	2.5Y 6/6	Silty SAND: olive yellow, very fine, damp, loose
					35				
		☒			40		SM	2.5Y 6/8	same as above

K:\Boeing\C-6 Boring Logs\C-2-199b.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-199
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine
					45				
		✓			50			2.5Y 6/8	olive yellow, damp, loose, very fine to fine sand
					55				
		✓			60			2.5Y	damp, loose
					65				Total Depth = 60'
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-199bb.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: F16		Boring Name C-2-211	
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 1.5	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-25-01	DATE COMPLETED 5-25-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 20 feet.
					5				
					10				
					15				
		✓			20		ML	2.5Y 5/6	Clayey SILT: light olive brown, damp, stiff, trace amounts of sand and gravel
		✓			25			2.5Y 5/6	less clay
		✓			30		SM	2.5Y 6/6	Silty SAND: olive yellow, damp, loose
					35				
		✓			40		SM	2.5Y 6/8	same as above, very fine to fine sand

K:\Boeing\C-6 Boring Logs\C-2-211a.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-211
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine to fine sand
					45				
					50				
					55				
								2.5Y 6/8	Silty SAND: olive yellow, damp, loose
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-211aa.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: D13		Boring Name	C-2-219
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-25-01	DATE COMPLETED 5-25-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 20 feet.
					5				
					10				
					15				
		☒			20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, medium stiff
		☒			25				
		☒			30		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, slightly dense/loose, very fine sand
					35				
		☒			40		SM	2.5Y 6/4	Silty SAND: light yellowish brown, damp, loose, very fine to fine sand

K:\Boeing\C-6 Boring Logs\C-2-219a.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-219
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose, very fine to fine sand
					45				
					50				
					55				
					60			2.5Y 6/8	Silty SAND: olive yellow, damp, loose
									Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-219aa.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: Open Space	Boring Name: C-2-255
DRILLING COMPANY: West Hazmat; DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 60.5
LOGGED BY: M. Balderman	DATE STARTED: 5-4-01 ; DATE COMPLETED: 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Fine to coarse silty sand with gravel and concrete fragments at surface (fill)
					5				red brick fragments (fill)
					10				
					15		ML	10YR 4/2	Clayey SILT: dark grayish brown, minor fine sand, trace fine mica, damp, medium stiff
		☒			20				
		☒			25		SM	10YR 5/4 10YR 6/2	Fine Silty SAND: yellowish brown, 60 % fine sand, dense, damp, trace fine mica
		☒			30			2.5Y 5/4	Fine Silty SAND: yellowish brown, 75 % fine sand, damp, dense, trace fine mica
					35				
		☒			40			2.5Y 5/4	Fine Silty SAND: yellowish brown as above, 80 % sand, very dense

K:\Boeing\C-6 Boring Logs\C-2-255a.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-255
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	2.5Y 5/4	Silty SAND: brownish yellow, 75 % fine sand, trace fine mica, damp, dense
					45				
					50		SM	10YR 5/4 5Y 6/1	Silty SAND: yellowish brown, 70 % sand, dense, damp, trace fine mica, brown mottled with gray
					55				
					60		CL	10YR 5/4 5Y 5/2	Silty CLAY: yellowish brown: minor fine sand, trace fine mica, damp, hard, brown mottled with gray
									Total Depth = 60.5'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-255aa.dwg, 7/31/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: Open Space	Boring Name: C-2-352
DRILLING COMPANY: West Hazmat / DRILLER: Doug	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 60.5
LOGGED BY: M. Balderman	DATE STARTED: 5-4-01 / DATE COMPLETED: 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5		CL	5Y 3/2	Silty CLAY: dark olive gray, minor fine sand, damp, medium stiff, medium plasticity
					10		CL	10YR 4/2	Silty CLAY: dark grayish brown, damp, medium stiff, low plasticity
					15				
					20		ML	10YR 5/4	Fine Sandy SILT: yellowish brown, with clay, 30 % fine sand, trace mica, damp, stiff
					25		SM	10YR 5/4 5Y 7/2	Fine Silty SAND: yellowish brown, 65 % fine sand, minor clay, trace fine mica, damp, dense, brown mottled with gray
					30		SM/SP	10YR 6/2 10YR 5/4 10YR 4/4	Sandy SILT/Silty SAND: light brownish gray, 10 % fine sand, minor fine mica, damp, dense, mottled brown and gray
					35				
					40		SM	10YR 6/2 (dry) 10YR 5/4 (wet)	Fine Silty SAND: light brownish gray, 85 % fine sand, trace fine mica, damp, dense

K:\Boeing\C-6 Boring Logs\C-2-352a.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: C-2-352
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 6/2 (dry) 10YR 6/2 (wet)	Fine Silty SAND: light brownish gray, 85 % fine sand, trace fine mica, damp, dense
					45				
					50		CH/CL	10YR 6/2	Top sample SAND as above at 49.7' Silty CLAY: light brownish gray, high plasticity, hard
					55				
					60		SM	5Y 6/1 (dry) 10YR 6/2 (moist)	Fine Silty SAND: light brownish gray, 80 % fine sand, minor fine mica, damp, very dense
					65				Total Depth = 60.5'
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\C-2-352aa.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 36		Boring Name: 2BB-36-11	
DRILLING COMPANY: Water D	DRILLER: Brian	Project Name: Boeing C-6, Parcel C	
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01	
DEPTH TO WATER (ft.): Not Encountered		ELEVATION (ft. MSL): .	TOTAL DEPTH (ft.): 60
LOGGED BY: JK		DATE STARTED: 5-17-01	DATE COMPLETED: 5-17-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
							CL	10YR 3/4	Silty CLAY: dark yellowish brown, moist, stiff
					5				
					10		ML	2.5Y 4/4	Clayey SILT: olive brown, damp, stiff
					15				
					20				less clay
					25				
					30				
					35				
					40				slightly more clay

K:\Boeing\C-6 Boring Logs\2BB-36-11o.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name 2BB-36-11
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML		Clayey SILT: continued
					45				
					50		SM	10YR 6/8	Silty SAND: brownish yellow, damp, loose, slight odor
					55				
								5Y 4/4	olive, increase in odor
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\2BB-36-11aa.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: 3-0		Boring Name 3-0-1
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-16-01 / DATE COMPLETED 5-16-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									6" Asphalt
							CL	10YR 4/6	Silty CLAY: dark yellowish brown, moist, stiff, trace amounts of gravel
					5				
		X			10				Silty CLAY: dark yellowish brown, damp/dry, stiff
					15				
		X			20		ML	10YR 5/4	Clayey SILT: yellowish brown, damp, stiff
		X			25				
		X			30			10YR 5/3	Clayey SILT: brown, damp, stiff, slightly less clay
					35				
		X			40				

K:\Boeing\C-6 Boring Logs\3-0-1a.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name 3-0-1
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML	10YR 5/3	Clayey SILT: brown, damp, stiff, slightly less clay
					45				
					50		ML	5Y 5/2	Clayey SILT: olive gray, damp/moist, medium stiff
					55				
					60		SM	2.5Y 5/6	Silty SAND: light olive brown, moist, loose
									Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\3-0-1aa.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: 15	Boring Name: 15
DRILLING COMPANY: West Hazmat	DRILLER: Doug
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 6
	Project Name: Boeing C-6, Parcel C
	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): .
	TOTAL DEPTH (ft.): 60
LOGGED BY: M. Balderman	DATE STARTED: 5-17-01
	DATE COMPLETED: 5-17-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5		CL	10YR 5/4	Silty CLAY: yellowish brown, damp, stiff
		✓			10				
					15				
		✓			20		ML	10YR 5/4	Clayey SILT: yellowish brown, damp, stiff
		✓			25				
		✓			30		SM	2.5Y 5/4	Silty SAND: light olive brown, damp, medium stiff, very fine sand, poorly sorted
					35				
		✓			40			10YR 5/6	Silty SAND: yellowish brown, damp, loose, very fine sand, poorly sorted

K:\Boeing\C-6 Boring Logs\15a.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name 15
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 5/6	Silty SAND: yellowish brown, damp, loose, very fine sand, poorly sorted
					45				
		X			50		SM	2.5Y 5/6 5G 5/2	Silty SAND: mottled light olive brown and grayish green, damp, loose, very fine sand, poorly sorted
					55				
		X			60		SM	2.5Y 5/2	Silty SAND: grayish brown, very fine, damp/moist, medium dense
					65				Total Depth = 60'
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\15aa.dwg, 8/1/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: Parcel D	Boring Name: D-1
DRILLING COMPANY: West Hazmat / DRILLER: Steve	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 6	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 55
LOGGED BY: TD	DATE STARTED: 11-29-01 / DATE COMPLETED: 11-29-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									0-35' logged from cuttings
					5		ML	10YR 4/4	Sandy SILT to Clayey SILT: dark yellowish brown, damp, stiff
					10				
					15				
					20				
					25				
					30				
					35		SM	2.5Y 5/6	Silty SAND: light olive brown, very fine to fine sand, damp, medium dense, trace amounts of iron oxide staining (orange)
					40				

K:\Boeing\C-6 Boring Logs\D-1a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: D-1
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45		SP	2.5Y 5/6	SAND: light olive brown, very fine, dense, some iron staining (orange)
					50		SP	2.5Y 5/6	SAND: light olive brown, very fine to medium sand, damp, dense, some iron staining
					55				Total Depth = 55'
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\D-1aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: Open Space	Boring Name: D-29
DRILLING COMPANY: West Hazmat / DRILLER: Steve	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 4	Project Number: 004032.01
DEPTH TO WATER (ft.): 70	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 70
LOGGED BY: TD	DATE STARTED: 1-29-01 / DATE COMPLETED: 1-29-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									4" Asphalt 4" Concrete
							CL	10YR 4/4	Silty CLAY: dark yellowish brown, damp, stiff
					5				
					10				
					15		ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff
					20				
					25				
					30				
					35				
					40				

K:\Boeing\C-6 Boring Logs\D-29a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: D-29
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff
					45				
					50		SP	10YR 5/4	SAND: yellowish brown, fine grain, damp, medium dense
					55				
					60		SP	10YR 5/4	SAND: yellowish brown, medium grain, damp, medium dense
					65				
					70				Groundwater Total Depth = 70'
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\D-29aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: F20	Boring Name: F20-5
DRILLING COMPANY: WDC / DRILLER: Ron	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger / DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 61
LOGGED BY: TD	DATE STARTED: 5-11-01 / DATE COMPLETED: 5-11-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Gravel at surface
					5				
					10				Fill - mixed soils / scattered gravel
					15				
					20		ML	10YR 5/4	Fine Sandy SILT with CLAY: yellowish brown, 30 % fine sand, damp, stiff
					25		SM	10YR 6/2 10YR 6/6	Fine Silty SAND: light brownish gray to brownish yellow, 70 % fine sand, dense, mottled color
					30			10YR 6/6	Fine Silty SAND: brownish yellow, 80 % sand, damp, very dense
					35				
					40				

K:\Boeing\C-6 Boring Logs\F-20-5a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: F20-5
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 6/6	Fine Silty SAND: brownish yellow, 80 % sand, damp, very dense
					45				
					50		SP	10YR 7/4	Fine to Medium SAND: very pale brown, minor silt, ~15 % hard nodules, damp, very dense
					55				
					60		SM	10YR 5/4	Fine Silty SAND: yellowish brown, 65 % fine sand, trace fine mica, damp, very dense
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\F20-5aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: Open Space		Boring Name	I24
DRILLING COMPANY West Hazmat	DRILLER Steve	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) 70		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 75
LOGGED BY TD		DATE STARTED 11-29-01	DATE COMPLETED 11-29-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5		CL	10YR 4/4	Silty CLAY: dark yellowish brown, damp, stiff
					10		ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff
					15				
					20		ML	10YR 4/4	dark yellowish brown, damp, stiff, less clay than 15'
					25				
							SM	10YR 5/4	Silty SAND: yellowish brown, damp, medium dense
					30				
					35				
					40				

K:\Boeing\C-6 Boring Logs\I24a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: I24
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 5/4	Silty SAND: yellowish brown, damp, medium dense
					45				
					50				
					55				
					60		SP	10YR 5/4	SAND: yellowish brown, very fine to medium, damp, dense
					65				
					70				
					75				Total Depth = 75'
					80				
					85				

K:\Boeing\C-6 Boring Logs\I24aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: Open Space		Boring Name	I34
DRILLING COMPANY West Hazmat	DRILLER Steve	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) 70		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 70
LOGGED BY TD		DATE STARTED 1-22-01	DATE COMPLETED 1-22-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									8" Concrete
							CL	10YR 4/4	Silty CLAY: dark yellowish brown, damp, stiff, some plasticity
					5				
					10				
					15				
					20		ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff, some plasticity
					25				
					30				
					35				
					40		SM	10YR 5/6	Silty SAND: yellowish brown, damp, dense, very fine

K:\Boeing\C-6 Boring Logs\I34a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: I34
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM	10YR 5/6	Silty SAND: yellowish brown, damp, dense, very fine
					45				
					50				
					55				
					60		ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff
							SM	10YR 5/4	Silty SAND: yellowish brown, fine to medium, dense
					65				
					70				Total Depth = 70'
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\I34aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: PD2	Boring Name: PD2
DRILLING COMPANY: West Hazmat	DRILLER: Doug
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 6
	Project Name: Boeing C-6, Parcel C
	Project Number: 004032.01
DEPTH TO WATER (ft.): 70	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 70
LOGGED BY: M. Balderman	DATE STARTED: 5-4-01 / DATE COMPLETED: 5-4-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									fine to coarse Clayey/Silty SAND with gravel and rubble at surface
					5				fill - mixed soils, brick and tile
					10				fill - mixed soils
					15				fill - mixed soils and brick pieces
					20		ML	10YR 5/4	Sandy SILT with CLAY: yellowish brown, 35 % fine sand, damp, stiff, massive
					25				
					30		ML	10YR 5/4	Clayey SILT: yellowish brown, 25 % fine sand, damp, stiff
					35				
					40		SP	10YR 7/4 (dry) 10YR 5/4 (wet)	SAND: very pale brown to yellowish brown, fine to medium, minor silt, fine mica, damp, dense, massive

K:\Boeing\C-6 Boring Logs\PD2a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD2
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SP		SAND: continued
					45				
					50		SM	10YR 6/6	Silty SAND: brownish yellow, fine, 80 % sand, damp, dense, minor fine mica, scattered shell fragments
					55				
					60		SM	10YR 6/2 10YR 5/4	Silty SAND: light brownish gray to yellowish brown, fine, 65 % sand, minor fine mica, moist, dense, mottled brown and gray (Note - saved middle tube - bottom one disturbed)
					65				
					70		SM	10YR 5/4	Silty SAND: yellowish brown, fine, 75 % sand, minor fine mica, wet, very dense
									Total Depth = 70'
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD2aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD16		Boring Name PD16
DRILLING COMPANY Water D	DRILLER Brian	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 70
LOGGED BY TD		DATE STARTED 1-4-00 / DATE COMPLETED 1-4-00

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
							CL	10YR 3/3	Silty CLAY: dark brown, damp, stiff
					5				mottled with iron stained nodules and calcium nodules
								10YR 4/6	dark yellowish brown
					10				
							ML	10YR 4/4	Clayey SILT: dark yellowish brown, damp, stiff
					15				decreasing clay
					20				
					25		CL	10YR 4/3	Silty CLAY: brown, damp, very stiff
					30				
					35				
					40				

K:\Boeing\C-6 Boring Logs\PD16a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD16
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		CL		Silty CLAY: continued
					45				
		✓			50		SM	2.5Y 5/4	Silty SAND: light olive brown, very fine, damp, medium dense
					55				
		✓			60		ML	2.5Y 5/4	Sandy SILT: olive brown, damp, stiff, strong odor
					65				
		✓			70		SM	2.5Y 5/6	Silty SAND: light olive brown, fine, strong odor, moist, dense
									Total Depth = 70'
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD16aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD20		Boring Name	PD20
DRILLING COMPANY West Hazmat	DRILLER Steve	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY TD		DATE STARTED 2-6-01	DATE COMPLETED 2-6-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
							CL	10YR 4/4	Silty CLAY: dark yellowish brown, moist to wet, medium stiff
					5				
					10		ML	10YR 4/4	Clayey SILT: dark yellowish brown, damp, stiff
					15				
					20		ML	10YR 4/6	dark yellowish brown, less clay content, increasingly silty
					25				
					30		ML	2.5Y 4/4	SILT: olive brown, damp, stiff
					35				
					40				

K:\Boeing\C-6 Boring Logs\PD20a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD20
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40				
					45				
					50		ML	5Y 4/4	SILT: olive, damp, stiff, trace amounts of very fine sand, with iron staining
							SM	2.5Y 5/6	Silty SAND: light olive brown, moist, medium dense, very fine to medium sand
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD20aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD21	Boring Name PD21
DRILLING COMPANY West Hazmat	DRILLER Steve
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6
	Project Name Boeing C-6, Parcel C
	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered	ELEVATION (ft. MSL) .
	TOTAL DEPTH (ft.) 60
LOGGED BY Tim Doyle	DATE STARTED 2-6-01
	DATE COMPLETED 2-6-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									6" Asphalt
							ML	10YR 4/6	Clayey SILT: yellowish brown, damp, stiff
		☒			5				
		☒			10				increase in clay content
		☒			15		SM	10YR 6/4	Silty SAND: light yellowish brown, damp, medium stiff, very fine sand
		☒			20				
					25				
		☒			30		ML	2.5Y 5/6	Clayey SILT: light olive brown, damp, stiff
					35				
		☒			40		CL	2.5Y 4/4	Silty CLAY: olive brown, damp, stiff, low plasticity

K:\Boeing\C-6 Boring Logs\PD21a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD21
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		CL		Silty CLAY: continued
					45				
					50		SM	2.5Y 5/6	Silty SAND: light olive brown, damp, medium dense, mottled with iron staining
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD21aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD22		Boring Name PD22	
DRILLING COMPANY West Hazmat	DRILLER Steve	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 6	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY Tim Doyle		DATE STARTED 2-6-01	DATE COMPLETED 2-6-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									6" Asphalt
							ML	10YR 4/6	Clayey SILT: dark yellowish brown, damp, stiff, trace amounts of medium sand
		☒			5				
		☒			10				
		☒			15		SM	2.5Y 5/6	Silty SAND: light olive brown, damp, dense, very fine sand
		☒			20		ML	2.5Y 4/4	SILT: olive brown, damp, stiff, trace amounts of clay content
					25				
		☒			30		SM	2.5Y 4/4	Silty SAND: olive brown, damp, dense, very fine sand
					35				
		☒			40		ML	2.5Y 4/4	SILT: olive brown, damp, stiff, some clay

K:\Boeing\C-6 Boring Logs\PD22a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD22
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40				
					45				
					50		ML	2.5Y 4/4	SILT: olive brown, damp, stiff
					55				
					60		ML	2.5Y 5/4	light olive brown, slight odor
									Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD22aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD23	Boring Name PD23
DRILLING COMPANY Water D	DRILLER Rod
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8
	Project Name Boeing C-6, Parcel C
	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered	ELEVATION (ft. MSL) .
	TOTAL DEPTH (ft.) 61
LOGGED BY M. Balderman	DATE STARTED 5-11-01
	DATE COMPLETED 5-11-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Clayey SILT w/sand and gravel at surface
							ML	10YR 4/2	Clayey SILT: dark grayish brown, minor fine sand, damp, medium stiff
		☒			5				
		☒			10		SM	10YR 5/4	Silty SAND: yellowish brown, 60 % fine sand, minor clay, damp, dense
		☒			15				
		☒			20		ML	10YR 5/4	Sandy SILT: yellowish brown, 35 % fine sand, damp, medium stiff
					25		SM	10YR 5/4	Silty SAND: yellowish brown, 60 % fine sand, trace fine mica, damp, dense, minor gray mottling
		☒			30		ML	10YR 5/4	Sandy SILT: yellowish brown, 40 % fine sand, damp, dense
					35				
		☒			40				mottled with CaCO3

K:\Boeing\C-6 Boring Logs\PD23a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD23
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML		Sandy SILT: continued
					45				
					50		SM	10YR 6/2 10YR 6/6	Silty SAND: light brownish gray to brownish yellow, 70 % sand, trace fine mica, damp/moist, dense, mottled
					55				
					60		SM	10YR 6/6	Silty SAND: brownish yellow, fine to medium, 80 % sand, trace fine mica, damp, dense
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD23aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD24	Boring Name: PD24
DRILLING COMPANY: Kehoe DRILLER: Steve	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Direct Push DRILL BIT (S) SIZE (in.): 1.5	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 60
LOGGED BY: JK	DATE STARTED: 5-15-01 / DATE COMPLETED: 5-16-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									4" Asphalt
							CL	10YR 3/3	Silty CLAY: dark brown, slightly moist, very stiff
					5		ML	10YR 5/6	Clayey SILT: yellowish brown, slightly moist, stiff
		✕			10				slightly moist, hard
					15				
							SM	10YR 5/6	Silty SAND: yellowish brown, fine, dry, dense
		✕			20				
							ML	10YR 4/4	Clayey SILT: dark yellowish brown, moist, firm
		✕			25				
		✕			30		CL	10YR 4/4	Silty CLAY: dark yellowish brown, slightly moist, hard
					35				
		✕			40				moist, very stiff

K:\Boeing\C-6 Boring Logs\PD24a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD24
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		CL		Silty CLAY: continued
					45				
					50		SM	5Y 5/3	Silty SAND: olive, very fine, moist/damp, medium dense
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD24aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD25		Boring Name	PD25
DRILLING COMPANY Kehoe	DRILLER Steve	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Direct Push	DRILL BIT (S) SIZE (in.) 1.5	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 50
LOGGED BY JK		DATE STARTED 5-14-01	DATE COMPLETED 5-15-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									3" Asphalt
					5				
		■			10		ML	10YR 4/4	Clayey SILT: dark yellowish brown, slightly moist, very stiff
					15				
		■			20				moist, stiff
							CL	10YR 5/4	Silty CLAY: yellowish brown, slightly moist, hard, with some calcareous stringers
		■			25				
		■			30		ML	10YR 4/4	SILT with some Clay: dark yellowish brown, trace of fine sand, moist, stiff
					35				
		■			40		ML	10YR 4/4	Sandy SILT: dark yellowish brown, moist, very stiff, trace of clay

K:\Boeing\C-6 Boring Logs\PD25a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD25
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML		Sandy SILT: continued
					45				
							ML	10YR 6/3	Clayey SILT: pale brown, moist, soft
					50				Boring terminated at 50' due to refusal, push rod seized in the hole.
					55				
					60				
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD25aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD26		Boring Name PD26	
DRILLING COMPANY Water D	DRILLER Rod	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 61
LOGGED BY M. Balderman		DATE STARTED 5-11-01	DATE COMPLETED 5-11-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Fill - mixed soils at surface No samples collected to 9 feet.
					5				
		☒			10		ML	10YR 4/4	Sandy SILT: dark yellowish brown, 35 % fine sand, minor clay, damp, medium stiff
					15				
		☒			20				stiff
		☒			25				increased clay, very stiff
		☒			30		SM/ML	10YR 5/4	Sandy SILT and Silty SAND: yellowish brown, varying 40-60 % sand in layers, damp, very dense
					35				
		☒			40		SM	10YR 6/6 10YR 6/2	Silty SAND with Clay: brownish yellow to light brownish gray, trace mica, moist, very dense, brown and gray mottled hard silty clay

K:\Boeing\C-6 Boring Logs\PD26a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD26
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		ML	10YR 5/4 10YR 6/6	Clayey SILT: yellowish brown to brownish yellow, 20 % fine sand, moist, stiff, with irregular layers, fine silty sand, mottled color
					55				
					60		SM/ML	5Y 5/2 5Y 4/4	Sandy SILT-CLayey SILT: olive gray to olive, fine silty sand inter layered, moist, stiff, mottled color
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD26aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD27		Boring Name PD27	
DRILLING COMPANY Water D	DRILLER Brian	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-18-01	DATE COMPLETED 5-18-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									mixed soil and concrete rubble at surface
									No samples collected to 9 feet.
					5				
		☒			10		ML	10YR 5/4	Clayey SILT: yellowish brown, fine sand, damp, stiff, local CaC03 mottling
					15				
		☒			20				Sandy SILT: yellowish brown, 40 % fine sand, minor clay, damp, stiff
		☒			25				moist
		☒			30			10YR 5/4 5Y 5/2	yellowish brown to olive gray, chemical odor
					35				
		☒			40		ML/SM	10YR 5/4	Sandy SILT and Silty SAND: yellowish brown, 50 % fine sand, moist, dense, strong acetone odor

K:\Boeing\C-6 Boring Logs\PD27a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD27
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML/SM		Sandy SILT and Silty SAND: continued
					45				strong acetone odor at top boring cutting, moist
					50		SM	10YR 6/6 10YR 6/2	Silty SAND: brownish yellow to yellowish brown, 65 % sand, moist, dense, mottled color, strong acetone odor
					55				
							SM	5Y 6/1 10YR 5/4	Silty SAND: gray to yellowish brown, 75 % fine sand, moist, dense, mottled color, strong acetone odor
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD27aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD28	Boring Name PD28
DRILLING COMPANY Water D / DRILLER Brian	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow-Stem Auger / DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered	ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman	DATE STARTED 5-22-01 / DATE COMPLETED 5-22-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 9 feet.
					5				
					10		CL	2.5Y 4/4	Silty CLAY: olive brown, damp, stiff
					15				
					20		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, stiff
					25			2.5Y 4/4	olive brown
					30			2.5Y 3/3	dark olive brown
					35				
					40			2.5Y 4/4	olive brown, slightly more clay content, stiff

K:\Boeing\C-6 Boring Logs\PD28a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD28
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML		Clayey SILT: continued
					45				
					50		SM	2.5Y 5/4	Silty SAND: light olive brown, very fine, damp, loose, odor
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD28aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD29		Boring Name PD29	
DRILLING COMPANY Water D	DRILLER Brian	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-18-01	DATE COMPLETED 5-18-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Fill - mixed soils with brick fragments at surface No samples collected to 19 feet.
					5				
		■			10				
					15				
		■			20		ML	10YR 5/4	Clayey SILT: yellowish brown, minor fine sand, local concentration CaC03, damp, medium stiff
		■			25				
		■			30				
					35				
		■			40		ML/SM	10YR 5/4	Sandy SILT and Silty SAND: yellowish brown, inter layered, 35-60 % fine sand, damp, moist, dense

K:\Boeing\C-6 Boring Logs\PD29a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD29
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML/SM		Sandy SILT and Silty SAND: continued
					45				
					50		SM	10YR 6/6 5Y 8/1	Silty SAND: brownish yellow to white, 80 % sand, scattered fine shell fragments, damp, dense, mottled color
					55				
								10YR 5/4	Silty SAND: yellowish brown to olive gray, 75 % sand, damp, moist, dense
								5Y 5/2	Sandy SILT: olive gray, 40 % sand, moist, stiff
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD29aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD30		Boring Name PD30	
DRILLING COMPANY Water D	DRILLER Brian	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY M. Balderman		DATE STARTED 5-18-01	DATE COMPLETED 5-18-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 10 feet.
					5				
					10				Fill - mixed soils with brick fragment
					15				
					20		ML	10YR 5/4	Sandy SILT: yellowish brown, minor clay, 35 % sand, local CaC03 concentrations, damp, stiff
					25				
					30		ML	10YR 5/4 10YR 6/2	Clayey SILT: yellowish brown to light brownish gray, minor fine sand, damp, stiff, mottled colors
					35				
					40		SM	10YR 6/2	Silty SAND: light brownish gray, 80 % fine sand, damp, dense, thin inter beds fine sandy silt, local Fe stain

K:\Boeing\C-6 Boring Logs\PD30a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD30
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		SM	10YR 6/6	Silty SAND: brownish yellow, 70 % sand, trace fine mica, minor fine shell fragments, moist, dense
					55				
							SM	10YR 5/4	Silty SAND: yellowish brown, minor clay, trace fine mica, 60 % sand, moist, very dense
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD30aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: PD32		Boring Name PD32	
DRILLING COMPANY West Hazmat	DRILLER Doug	Project Name Boeing C-6, Parcel C	
DRILLING METHOD (S) Hollow-Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01	
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 60
LOGGED BY TD		DATE STARTED 6-1-01	DATE COMPLETED 6-1-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									No samples collected to 9 feet.
					5				
					10		CL	10YR 4/6	Silty CLAY: dark yellowish brown, damp, stiff
					15				
					20		ML	2.5Y 4/4	Clayey SILT: olive brown, damp, stiff, trace amounts of calcium carbonate
					25				
					30				slightly more silt than above
					35				
					40		SM	2.5Y 6/1	Silty SAND: gray, damp, loose

K:\Boeing\C-6 Boring Logs\PD32a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: PD32
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		SM	2.5Y 5/6	Silty SAND: light olive brown, damp, loose
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\PD32aa.dwg, 8/2/2001

TEST BORING REPORT

Boring No. PD-34

Project: Former Boeing C-6 Facility Torrance, CA
Client: Boeing Realty Corporation
Contractor: West Hazmat Drilling

File No. 27285-001
Sheet No. 1 of 3
Start: June 7, 2001
Finish: June 7, 2001
Driller: T. Barrow
H&A Rep.: J. Talpey
Elevation
Datum
Location: See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	--	Rig Make & Model: CME-95
Inside Diameter (in.)	4-1/4	2	--	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb.)	--	140	-	Casing: HSA
Hammer Fall (in.)	--	30	-	Hoist/Hammer: Winch Safety Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Advanced augers to 10.0 ft. without sampling.										
5																	
10	15 19 22	S1 18 in.	10.0 11.5			ML	Dense brown gravelly SILT, with brick fragments. VOC Reading: 78 ppm	5	5	--	--	20	70	N	L	N	L
15					15.0												
20																	

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
Groundwater Not Encountered					

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	61.5
Rock Cored (lin. ft.)	None
Samples	7S

Boring No. PD-34

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size (in millimeters).

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-34
File No. 27285-001
Sheet No. 2 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	18 38 21	S2 18 in.	20.0 21.5			ML	Very stiff, brown SILT with clay, damp grades to silt with fine sand. VOC Reading: 74 ppm.	--	--	--	--	--	100	N	L	N	L
					23.0												
25	25 31 33	S3 17 in.	25.0 26.5			CL	Very stiff, dark brown sandy LEAN CLAY, with few pieces of gravel, damp and with specks of black organic material. VOC Reading: 10 ppm	--	2	--	--	10	88	N	H	M	M
30	29 36 32	S4 18 in.	30.0 31.5				Same. VOC Reading: 28 ppm.										
35																	
					37.0												
40	21 31 38	S5 14 in.	40.0 41.5			CL	Very stiff, brown fat CLAY with white veining and specks of black organic material, silty sand partings, and interlayered with brown clayey silt. VOC Reading: ND	--	--	--	--	--	100	N	H	H	H
45																	
					47.0												

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-34

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-34
File No. 27285-001
Sheet No. 3 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	40 44 40	S6 18 in.	50.0 51.5			SP-SM	Very dense, gray fine SAND with silt, iron-staining, no odor. VOC Reading: ND.	--	--	--	--	90	10	N	L	N	N
55					57.0												
60	27 32 37	S7 18 in.	60.0 61.5			CH	Very stiff gray fat CLAY, with iron-staining, plastic. VOC Reading: ND	--	--	--	--	--	100	N	H	H	H
					61.5		Bottom of Test Boring at 61.5 ft.										

Grouted borehole through augers with WYOBEN Grout-Well bentonite slurry.

Soil headspace readings taken with a photovac 2020 organic vapor meter calibrated to isobutylene. Soil samples submitted to ___ for VOC analysis.

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

Boring No. PD-35

Project: Former Boeing C-6 Facility Torrance, CA
Client: Boeing Realty Corporation
Contractor: West Hazmat Drilling

File No. 27285-001
Sheet No. 1 of 3
Start: June 7, 2001
Finish: June 7, 2001
Driller: T. Barrow
H&A Rep.: J. Talpey
Elevation
Datum
Location: See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	--	Rig Make & Model: CME-95
Inside Diameter (in.)	4-1/4	2	--	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb.)	--	140	-	Casing: HSA
Hammer Fall (in.)	--	30	-	Hoist/Hammer: Winch Safety Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Advanced augers to 10.0 ft. without sampling.										
5																	
10	14 18 23	S1 15 in.	10.0 11.5			CH	Stiff brown organic-rich sandy fat CLAY interlayered with brick-red SILT. VOC Reading: 49 ppm.	--	--	.5	5	5	85	N	M	H	H
15					16.0												
20																	

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
Groundwater Not Encountered					

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	61.5
Rock Cored (lin. ft.)	None
Samples	7S

Boring No. PD-35

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size (in millimeters).

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-35
File No. 27285-001
Sheet No. 2 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	17 23 28	S2 18 in.	20.0 21.5			ML	Dense red-brown SILT, interlayered with brown lean CLAY, damp. VOC Reading: 52 ppm.	--	--	--	--	--	100	N	L	N	L
					24.0												
25	21 26 33	S3 18 in.	25.0 26.5			ML-CL	Dense brown SILT, wet, inerlayered with hard, partly cemented clayey silt seams. VOC Reading: 262 ppm.	--	--	--	--	--	100	N	M	M	M
30	21 26 33	S4 18 in.	30.0 31.5			MH	Brown elastic SILT with clay, damp, low plasticity. VOC Reading: 75 ppm.	--	--	--	5	5	90	N	M	L	L
35																	
40	22 33 36	S5 18 in.	40.0 41.5			MH	Same, and with mica particles. VOC Reading: 59 ppm.	--	--	--	--	--	100	N	M	L	M
45																	
					49.0												

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-35

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-35
File No. 27285-001
Sheet No. 3 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	30 36 39	S6 18 in.	50.0 51.5			SM	Very dense gray and light _____, fine sandy SILT, partly cemented, no dry strengths. VOC Reading: 10 ppm.	--	--	--	--	10	80	N	L	N	N
55																	
60	27 32 40	S7 18 in.	60.0 61.5			SP	Very dense brown poorly graded SAND with shell fragments, iron-staining, fine-grained, few pebbles. VOC Reading: 28 ppm.	--	--	--	5	90	5	N	L	N	N
					61.5		Bottom of Test Boring at 61.5 ft.										

Grouted borehole through augers with WYOBEN Grout-Well bentonite slurry.

Soil headspace readings taken with a photovac 2020 organic vapor meter calibrated to isobutylene. Soil samples submitted to lab for VOC analysis.

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-35

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

Boring No. PD-36

Project: Former Boeing C-6 Facility Torrance, CA
Client: Boeing Realty Corporation
Contractor: West Hazmat Drilling

File No. 27285-001
Sheet No. 1 of 3
Start: June 7, 2001
Finish: June 7, 2001
Driller: T. Barrow
H&A Rep.: J. Talpey
Elevation
Datum
Location: See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	--	Rig Make & Model: CME-95
Inside Diameter (in.)	4-1/4	2	--	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb.)	--	140	-	Casing: HSA
Hammer Fall (in.)	--	30	-	Hoist/Hammer: Winch Safety Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Advanced augers to 10.0 ft. without sampling.										
5																	
10	15 17 22	S1 18 in.	10.0 11.5			CH	Stiff brown silty FAT CLAY, with many specks of black organic material, resembles organic soil/topsoil. VOC Reading: 450 ppm.	--	--	--	--	--	100	N	H	H	H
15																	
20																	

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
Groundwater Not Encountered					

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	61.5
Rock Cored (lin. ft.)	None
Samples	7S

Boring No. PD-36

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size (in millimeters).

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-36
File No. 27285-001
Sheet No. 2 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	12 13 18	S2 18 in.	20.0 21.5		20.0	ML	Medium dense brown SILT, crumbly, little or no dry strength. VOC Reading: 38 ppm.	--	--	--	--	--	100	N	L	N	N
					23.0												
25	19 25 30	S3 18 in.	25.0 26.5			CL-ML	Very stiff brown lean CLAY with few pieces of gravel, interlayered with brown SILT. VOC Reading: ND.	--	1	--	--	--	99	N	M	M	M
30	22 22 32	S4 18 in.	30.0 31.5			CL	Very stiff brown lean CLAY, with white veining, medium plastic and with few coarse gravel. VOC Reading: ND.	--	--	--	--	--	98	N	H	M	H
35					36.0												
40	27 33 40	S5 18 in.	40.0 41.5			CL	Stiff gray lean CLAY with iron-staining. VOC Reading: 14 ppm.	--	--	--	--	--	100	N	H	M	H
45					47.0												

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-36

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

Boring No. PD-36
File No. 27285-001
Sheet No. 3 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	18 23 36	S6 18 in.	50.0 51.5			SP-SM	Dense brown fine SAND with silt, damp, no dry strength. VOC Reading: 4 ppm.	--	--	--	--	75	25	N	L	N	N
55																	
60	19 24 32	S7 18 in.	60.0 61.5			SM	Dense brown silty SAND with gravel and shell fragments, interlayered with gray fay CLAY, moist, plastic. VOC Reading: ND.	3	--	--	--	77	20	N	L	N	N
					61.5		Bottom of Test Boring at 61.5 ft.										

Grouted borehole through augers with WYOBEN Grout-Well bentonite slurry.

Soil headspace readings taken with a photovac 2020 organic vapor meter calibrated to isobutylene. Soil samples submitted to lab for VOC analysis.

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-36

TEST BORING REPORT

Boring No. PD-37

Project: Former Boeing C-6 Facility Torrance, CA
Client: Boeing Realty Corporation
Contractor: West Hazmat Drilling

File No. 27285-001
Sheet No. 1 of 3
Start: June 7, 2001
Finish: June 7, 2001
Driller: T. Barrow
H&A Rep.: J. Talpey
Elevation
Datum
Location: See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	--	Rig Make & Model: CME-95
Inside Diameter (in.)	4-1/4	2	--	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb.)	--	140	-	Casing: HSA
Hammer Fall (in.)	--	30	-	Hoist/Hammer: Winch Safety Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Advanced augers to 10.0 ft. without sampling.										
5																	
10	8 11 15	S1 17 in.	10.0 11.5			CL	Stiff brown sandy CLAY, moist. VOC Reading: 64 ppm.	--	--	--	5	10	85	N	M	M	M
15					15.0												
20																	

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
Groundwater Not Encountered					

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary	
Overburden (lin. ft.)	61.5
Rock Cored (lin. ft.)	None
Samples	7S

Boring No. PD-37

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size (in millimeters).

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-37
File No. 27285-001
Sheet No. 2 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	15 23 30	S2 16 in.	20.0 21.5			ML	Dense light brown SILT, damp. VOC Reading: 2000 ppm.	--	--	--	--	--	100	N	M	L	L
25	22 29 32	S3 18 in.	25.0 26.5			ML	Very dense red-brown SILT, damp. VOC Reading: 2000 ppm.	--	--	--	--	--	100	N	M	L	L
					29.0												
30	19 26 31	S4 18 in.	30.0 31.5			CH	Very stiff dark brown CLAY. VOC Reading: 1037 ppm.	--	--	--	--	--	100	N	M	H	H
35																	
					36.0												
40	27 33 39	S5 18 in.	40.0 41.5			CH	Very stiff gray CLAY, wet, plastic. VOC Reading: 2000 ppm.	--	--	--	--	--	100	N	M	H	H
45																	

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-37

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-37
File No. 27285-001
Sheet No. 3 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	26 34 44	S6 18 in.	50.0 51.5			CH	Very stiff gray fat CLAY, with brown silty sand seams, apparent sand-filled vertical cracks, pockets of white crusty material. VOC Reading: 700 ppm.	--	--	--	--	--	100	N	H	H	H
55					57.0												
60	19 28 33	S7 14 in.	60.0 61.5			SP	Dense brown SAND, damp. VOC Reading: 2000 ppm.	--	--	--	25	75	--	N	L	N	N
					61.5		Bottom of Test Boring at 61.5 ft.										

Grouted borehole through augers with WYOBEN Grout-Well bentonite slurry.

Soil headspace readings taken with a photovac 2020 organic vapor meter calibrated to isobutylene. Soil samples submitted to lab for VOC analysis.

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-37

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

Boring No. PD-38

Project: Former Boeing C-6 Facility Torrance, CA
Client: Boeing Realty Corporation
Contractor: West Hazmat Drilling

File No. 27285-001
Sheet No. 1 of 3
Start: June 7, 2001
Finish: June 7, 2001
Driller: T. Barrow
H&A Rep.: J. Talpey
Elevation
Datum
Location: See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	--	Rig Make & Model: CME-95
Inside Diameter (in.)	4-1/4	2	--	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb.)	--	140	-	Casing: HSA
Hammer Fall (in.)	--	30	-	Hoist/Hammer: Winch Safety Hammer

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Augered to 10.0 ft. without sampling.										
5																	
10	10 14 18	S1 18 in.	10.0 11.5			CH	Stiff gray CLAY with iron-staining. VOC Reading: >2000 ppm	--	--	--	--	--	100	N	M	H	H
15					15.0												
20																	

Water Level Data					
Date	Time	Elapsed Time (hr.)	Depth (ft.) to: Bottom of Casing	Bottom of Hole	Water
Groundwater Not Encountered					

Sample Identification	
O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon
G	Geoprobe

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

Summary
Overburden (lin. ft.) 61.5
Rock Cored (lin. ft.) None
Samples 7S

Boring No. PD-38

Field Tests: Dilatancy: R-Rapid, S-Slow, N-None; Toughness: L-Low, M-Medium, H-High; Plasticity: N-Nonplastic, L-Low, M-Medium, H-High; Dry Strength: N-None, L-Low, M-Medium, H-High, V-Very High

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size (in millimeters).

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-38
File No. 27285-001
Sheet No. 2 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	18 21 25	S2 18 in.	20.0 21.5			ML	Dense brown SILT, moist, semi-cohesive. VOC Reading: >2000 ppm.	--	--	--	--	--	100	N	M	N	L
25	16 20 22	S3 12 in.	25.0 26.5			ML	Medium dense gray SILT with sand, iron-stained, interlayered with brown sandy SILT. VOC Reading: 1143 ppm.	--	--	--	--	--	100	N	H	M	M
30	20 24 30	S4 18 in.	30.0 31.5			SP	Dense yellow-brown poorly-graded SAND, very fine grained, fluffy texture, resembles loess. VOC Reading: 942 ppm.	--	--	--	--	100	--	N	L	N	N
35					36.0												
40	19 22 32	S5 18 in.	40.0 41.5			SW-SM	Dense brown fine SAND with silt, containing layers of gray lean clay which are hard and damp.	--	--	--	--	80	20	N	L	N	N
							VOC Reading: >2000 ppm.	--	--	--	--	--	100	N	H	M	H
45					47.0												

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size.

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-38

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

TEST BORING REPORT

HALEY & ALDRICH

Boring No. PD-38
File No. 27285-001
Sheet No. 3 of 3

Depth (ft.)	SPT*	Sample No. & Rec. (in.)	Sample Depth (ft.)	Well Diagram	Elev./Depth (ft.)	USCS Symbol	Visual-Manual Identification and Description (Density/consistency, color, GROUP NAME, max. particle size**, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	20 25 31	S6 14 in.	50.0 51.5			SP	Dense gray poorly-graded SAND, fine-grained, with gravelly seams containing crystalline calcite, cemented.	--	--	--	--	95	5	N	L	N	N
							VOC Reading: >2000 ppm.	15	15	10	10	30	20	N	H	N	H
55																	
					57.0												
60	26 30 32	S7 15 in.	60.0 61.5			SM	Dense gray-brown silty SAND, wet, fine-grained, with mica particles.	--	--	--	--	90	10	N	L	N	N
							VOC Reading: 1515 ppm.										
					61.5		Bottom of Test Boring at 61.5 ft.										

Grouted borehole through augers with WYOBEN Grout-Well bentonite slurry.

Soil headspace readings taken with a photovac 2020 organic vapor meter calibrated to isobutylene. Soil samples submitted to lab for VOC analysis.

*SPT = Sampler blows per 6 in. **Maximum particle size (mm) is determined by direct observation within the limitations of sampler size

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PD-38

USCS_TB3 USCSLIB3.GLB USCSTBG3.GDT C:\FILES\001LOGS.GPJ Mar 13, 02

HALEY & ALDRICH

TEST BORING REPORT

BORING NO. **PD-39**

Page 1 of 1

PROJECT	Boeing Realty Corp. Former C-6 facility	H&A FILE NO.	27285-005
LOCATION		PROJECT MGR.	Scott Zachary
CLIENT		FIELD REP.	H. Hernandez
CONTRACTOR		DATE STARTED	6/24/2001
DRILLER	West Hazmat	DATE FINISHED	6/24/2001

Elevation ft. Datum

Boring Location

Item	Casing	Sampler	Core Barrel
Type	HAS	Sumit-probe	
Inside Diameter (in.)	4.25		
Hammer Weight (lb.)			
Hammer Fall (in.)			

Rig Make & Model: CME-75

- [x] Truck
- [ ] ATV
- [ ] Track
- [ ] Skid
- [ ] Tripod
- [ ] Geoprobe
- [ ] Air Track
- [ ] Cat-Head
- [ ] Winch
- [ ] Roller Bit
- [x] Cutting Head

Hammer Type: [ ] Safety [ ] Doughnut [ ] Automatic

Drilling Mud: [ ] Bentonite [ ] Polymer [ ] None

Casing Advance Type Method Depth

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sumit-probe Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0																	
10	6 7 10	1.5	PD-29-10	1215	0	SM	Silty Sand (SM) yellow,brown moist medium dense loose well graded, mica	5	5	10	10	50	20	R	L	N	L
20	10 20 21	1.5	10-34-27	1223	0	CL	Lean Clay (CL) brown hued, low plasticity, cobbles	10	0	5	5	10	80		H	L	H
25	12 14 15	1.5	PD-39-25	1228	0												
30	10 20 23	1.5	PD-39-30	1234	0	SM	Silty Sand (SM) fine brown to light brown, dense					70	30				
40	10 26 30	1.5	PD-24-40	1240	0	SM	Silty Sand (SM) Yellow-brown, dense, very loose, fine to very fine sand, mica					70	30	R	L	N	L
50	10 12 15	1.5	10-39-50	1256	0.9	SP	Poorly Graded Sand (SP) yellow, brown, medium , dense, fine to very fine sand mica					100					
60	33 30	1.5	PD-39-60	1360	0	SP	Poorly Graded Sand (SP) yellow, brown, moist, dense, fine to medium fine mica				20	80					

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
7/11/2001					approx 67'

Sample ID

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon Sample
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (Linear ft.)

Rock Cored (Linear ft.)

Number of Samples

BORING NO. DDS-1-14

Field Tests: Dilatancy: R - Rapid S - Slow N - None; Toughness: L - Low M - Medium H - High; Plasticity: N - Nonplastic L - Low M - Medium H - High; Dry Strength: N - None L - Low M - Meduim H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

K:\template\forms\usc\ts_field_log.xls

Form #3600

HALEY & ALDRICH

TEST BORING REPORT

BORING NO. **PD-40**

Page 1 of 1

PROJECT	Boeing Realty Corp. Former C-6 facility	H&A FILE NO.	27285-005
LOCATION		PROJECT MGR.	Scott Zachary
CLIENT		FIELD REP.	H. Hernandez
CONTRACTOR		DATE STARTED	7/5/2001
DRILLER	West Hazmat	DATE FINISHED	7/2/2001

Elevation ft. Datum

Boring Location

Item	Casing	Sampler	Core Barrel
Type	HAS	Sumil-probe	
Inside Diameter (in.)	4.25		
Hammer Weight (lb.)			
Hammer Fall (in.)			

Rig Make & Model: CME-75

- [x] Truck
- [ ] ATV
- [ ] Track
- [ ] Skid
- [ ] Tripod
- [ ] Geoprobe
- [ ] Air Track
- [ ] Cat-Head
- [ ] Winch
- [ ] Roller Bit
- [x] Cutting Head

Hammer Type: [ ] Safety [ ] Doughnut [ ] Automatic

Drilling Mud: [ ] Bentonite [ ] Polymer [ ] None

Casing Advance: Type Method Depth

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sumil-probe Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0																	
	6																
10	7	1.5	PD-70-107	750	0	SM	Silty Sand (SM) Light Brown, Moist, Medium dense				10	10	40	R	N	N	N
	4																
	10																
20	17	NR					No Recovery										
	22																
	26	NR															
	50																
	13																
	12	1.5	PD-40-15	812	0	SM	Silty Sand (SM) yellow brown, moist, dense					7					
	16																
	16																
30	20	1.5	PD-40-10	820	0	SM	Same as above										
	25																
40	23	1.5	PD-10-40	828	0	SM	Silty Sand (SM) light brown, moist, dense, very	-	-	-	-	70	30				
	20						very fine to fine sand, mica										
	14																
50	15	1.5	PD-40-50	838	0	SP	Poorly graded sand (SP) yellow,brown,moist,dense, very	-	-	-	-	110					
	20						fine to fine sand, poorly graded										
	11						Same as above										
60	25	1.5	PD-10-60	846	0	SP	Boring terminated at 60 feet, no groundwater encountered										
	30						Boring was backfilled with bentonite grout										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
7/11/2001					approx 68'

Sample ID

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon Sample
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (Linear ft.)

Rock Cored (Linear ft.)

Number of Samples

BORING NO. DDS-1-11

Field Tests: Dilatancy: R - Rapid S - Slow N - None; Toughness: L - Low M - Medium H - High; Plasticity: N - Nonplastic L - Low M - Medium H - High; Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

K:\templates\formal\usc\b_field_log.xls

Form #3900

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Building 36	Boring Name: 2BB-36-9
DRILLING COMPANY: Water D; DRILLER: Brian	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 60
LOGGED BY: JK	DATE STARTED: 5-11-01 ; DATE COMPLETED: 5-11-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
							CL	10YR 3/3	Silty CLAY: dark brown, slightly moist, stiff
					5				
					10		ML	10YR 4/4	Clayey SILT: dark yellowish brown, slightly moist, hard
					15				
					20			10YR 5/4	yellowish brown, slightly moist, very stiff
					25				
					30			10YR 4/4	dark yellowish brown, some fine sand, stiff
					35				
					40				

K:\Boeing\C-6 Boring Logs\2BB-36-9a.dwg, 6/21/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name 2BB-36-9
Project Name Boeing C-6, Parcel C
Project Number 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		ML		Clayey Silt: continued
					45				
							SM	10YR 6/4	Silty SAND: light yellowish brown, fine, slightly moist, medium dense, slight solvent odor, some rust
					50				
					55				
							ML	2.5Y 4/4	Sandy SILT: olive brown, fine sand, moist, stiff, slight solvent odor, some rust
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\2BB-36-9aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: S24	Boring Name: S24-3
DRILLING COMPANY: Water D; DRILLER: Rod	Project Name: Boeing C-6, Parcel C
DRILLING METHOD (S): Hollow Stem Auger; DRILL BIT (S) SIZE (in.): 8	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . ; TOTAL DEPTH (ft.): 61
LOGGED BY: M. Balderman	DATE STARTED: 5-11-01 ; DATE COMPLETED: 5-11-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
									Fill - mixed soils at surface
							ML	5Y 3/2	Clayey SILT: dark olive gray, minor fine sand, damp, medium stiff, petroleum odor, greenish stain
					5				
									Auger plug wet with hydrocarbon, hydrocarbon on outside sampler also
		✓			10		ML	10YR 4/2	Sandy SILT: dark grayish brown, 40 % fine sand, moist, stiff, very strong petroleum odor
					15				
		✓			20				Sandy SILT with Clay: 30 % fine sand, damp, medium stiff, hydrocarbon odor
		✓			25		ML	10YR 4/2 10YR 2/2	Sandy SILT: dark grayish brown to very dark brown, 40 % fine sand, moist, medium stiff, hydrocarbon odor
		✓			30		SM/SP	10YR 6/6	SAND - Silty SAND: brownish yellow, 90 % fine sand, damp, dense
					35				
		✓			40		SM	10YR 5/4	Silty SAND: yellowish brown, 70 % fine sand, damp, moist, very dense

K:\Boeing\C-6 Boring Logs\S24-3a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: S24-3
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		ML	5Y 5/6 10YR 6/2	Clayey SILT: olive to light brownish gray, minor fine sand, thin silty sand layers, damp, moist, stiff, mottled color
					55				
					60				
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\S24-3aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: S24	Boring Name S24-4
DRILLING COMPANY Water D / DRILLER Rod	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger / DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered	ELEVATION (ft. MSL) . / TOTAL DEPTH (ft.) 63.5
LOGGED BY M. Balderman	DATE STARTED 5-10-01 / DATE COMPLETED 5-10-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				
		☒			10		ML	10YR 5/4	Clayey SILT: yellowish brown, minor fine sand, trace fine mica, damp, medium stiff
					15				
		☒			20		ML	10YR 5/4	Clayey SILT: yellowish brown, minor fine sand, mottled with CaC03, damp, hard
		☒			25		SM	10YR 5/4 10YR 6/2	Silty SAND: yellowish brown to light brownish gray, 65 % fine sand, damp, very dense, brown mottled with gray
		☒			30		SM	10YR 6/6	Silty SAND: brownish yellow, 70 % fine sand, damp, very dense
					35				
		☒			40				Silty SAND: brownish brown, 70 % fine sand, damp, very dense, with 1" inter bed clayey silt

K:\Boeing\C-6 Boring Logs\S24-4a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: S24-4
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		SM	10YR 5/4	Silty SAND: yellowish brown, 65 % fine sand, trace fine mica, damp, very dense
					55				
					60				
							ML	10YR 5/4	Clayey SILT: yellowish brown, minor fine sand, damp, hard
					65				Total Depth = 63.5'
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\S24-4aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: S24	Boring Name S24-5
DRILLING COMPANY Water D / DRILLER Rod	Project Name Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger / DRILL BIT (S) SIZE (in.) 8	Project Number 004032.01
DEPTH TO WATER (ft.) Not Encountered	ELEVATION (ft. MSL) - / TOTAL DEPTH (ft.) 61
LOGGED BY M. Balderman	DATE STARTED 5-10-01 / DATE COMPLETED 5-10-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				Fill - mixed soils, brown silty clay and clayey silt with sand and gravel
		☒			10		ML/SM	10YR 4/2	Sandy SILT and Silty SAND: dark grayish brown, 50 % fine sand, trace fine mica, damp, medium dense
					15				
		☒			20		ML	10YR 4/2	Clayey SILT: dark grayish brown, minor fine sand, mottled with CaC03, damp, medium stiff
		☒			25		SM	10YR 5/4 10YR 6/2	Silty SAND: yellowish brown to light brownish gray, 60 % sand, trace fine mica, damp, dense, brown mottled with gray
		☒			30				
					35				
		☒			40		SP	10YR 6/2	SAND: light brownish gray, minor silt, trace fine mica, damp, very dense cemented layer of shell fragments

K:\Boeing\C-6 Boring Logs\S24-5a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: S24-5
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SP		SAND: continued
					45				
					50		ML	10YR 6/2 10YR 5/4	Clayey SILT: light brownish gray to yellowish brown, minor fine sand, damp, stiff, mottled brown/gray
					55				
					60		SM	10YR 4/2	Silty SAND: dark grayish brown, 60 % sand, trace fine mica, moist, very dense
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\S24-5aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION Feature Number: S24		Boring Name	S24-6
DRILLING COMPANY Water D	DRILLER Rod	Project Name	Boeing C-6, Parcel C
DRILLING METHOD (S) Hollow Stem Auger	DRILL BIT (S) SIZE (in.) 8	Project Number	004032.01
DEPTH TO WATER (ft.) Not Encountered		ELEVATION (ft. MSL) .	TOTAL DEPTH (ft.) 61
LOGGED BY M. Balderman		DATE STARTED 5-10-01	DATE COMPLETED 5-10-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5		ML	10YR 5/4	Sandy Clayey SILT: yellowish brown, 30 % fine sand, damp, medium stiff
					10				
					15				
					20		CL	10YR 4/2	Silty CLAY: dark grayish brown, minor fine sand, damp, stiff
					25		SM	10YR 5/4 10YR 6/2	Silty SAND: yellowish brown to light brownish gray, 65 % sand, trace fine mica, damp, dense, mottled gray and brown
					30				
					35				
					40		SM	10YR 5/4	Silty SAND: yellowish brown, 80 % sand, trace fine mica, damp, very dense

K:\Boeing\C-6 Boring Logs\S24-6a.dwg, 6/27/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: S24-6
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		SM	10YR 5/4	Silty SAND: yellowish brown, 65 % fine sand, trace fine mica, damp, very dense
					55				
					60		CL	10YR 5/4	Silty CLAY: yellowish brown, minor fine sand, danp, hard, thin inter beds and fine silty sand, chemical odor in soil
									Total Depth = 61'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\S24-6aa.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: Feature Number: S24	Boring Name: S24-7
DRILLING COMPANY: Water D	DRILLER: Rod
DRILLING METHOD (S): Hollow Stem Auger	DRILL BIT (S) SIZE (in.): 8
	Project Name: Boeing C-6, Parcel C
	Project Number: 004032.01
DEPTH TO WATER (ft.): Not Encountered	ELEVATION (ft. MSL): . / TOTAL DEPTH (ft.): 60
LOGGED BY: M. Balderman	DATE STARTED: 5-22-01 / DATE COMPLETED: 5-22-01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	SOIL DESCRIPTION AND DRILLING REMARKS
					5				
		■			10		ML	2.5Y 5/4	Clayey SILT: light olive brown, damp, medium stiff
					15				
		■			20				
		■			25				
		■			30		SM	2.5Y 6/8	Silty SAND: olive yellow, very fine, damp, loose
					35				
		■			40				

K:\Boeing\C-6 Boring Logs\S24-7a.dwg, 8/2/2001

Boring Log

Kennedy/Jenks Consultants

Boring Name: S24-7
Project Name: Boeing C-6, Parcel C
Project Number: 004032.01

SAMPLES: Driven	Recovered	Collected	Blows per 6"	Head Space Reading (ppm)	Depth (feet)	Graphic Log	USCS Log	Munsell Color	
					40		SM		Silty SAND: continued
					45				
					50		SM	2.5Y 6/8	Silty SAND: olive yellow, damp, loose
					55				
					60				Total Depth = 60'
					65				
					70				
					75				
					80				
					85				

K:\Boeing\C-6 Boring Logs\S24-7aa.dwg, 8/2/2001